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We know networking can change the way companies do business, making them more competitive, productive and responsive to opportunities. We also know that you — our readers — deserve credit for the innovative ways you put network technology to work. That's why we started the User Excellence Awards program, now in its 12th year.

Get the recognition you deserve for your innovative networking efforts. Enter *Network World's* 12th Annual User Excellence Awards competition today!

Good Luck!

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

USER EXCELLENCE

TWELFTH

12

ANNUAL

AWARDS

Maybe it's a new distributed application that cut expenses and empowered workers like never before. Or a network redesign employing the latest technologies to offer improved response time and a growth path for the future. Whatever the case may be, we want to hear about your networking efforts.

Tell us in 750 words or less why your organization deserves the User Excellence Award. What we're looking for is innovative and effective use of network technology to achieve corporate objectives. Past winners were those who did the best job explaining the benefits of their network projects in terms of cutting costs, improving productivity and the like.

So be sure to:

- Make the business case — explain the tie between your network project and your organization's goals.
- Make the technology case — explain why you made the choices you did.
- Be specific— give figures that detail your savings and productivity gains.

Follow these simple guidelines and you'll have the chance to add your organization's name to the list of industry leaders that have already won a *Network World* User Excellence Award.

You'll also get some well-deserved recognition because winners of the 12th Annual User Excellence Awards will be featured in the special year-end Power Players issue of *Network World*. They will also be honored in an awards ceremony before the keynote address at the ComNet conference in Washington, D.C. in February.

So go ahead, blow your own horn. We'll be listening.

How to enter

- Your entry of 750 words or less may be submitted via:
  - the Internet (excellence@nww.com),
  - by fax at (508) 820-1103, or
  - Network World Fusion (http://www.nwfusion.com).
  - Or attach your entry to this form for use as a postage-paid mailer (see other side)
- Mail your entry to Network World, Attn: Special Products Editor, 161 Worcester Road, Framingham, MA 01701-9524.

All entries must be received **by Sept. 9** and must include your name, title, company name, address and phone number.

Please note: Entries will be accepted only from user organizations; no vendors or consultants, please.

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Past User Excellence Award winners

"The Network World *User Excellence Award was a true testimony to our strength as a front-end network solutions provider and helped us widen our client base to more than 30 airlines worldwide."*

Name and title: Larry Browder, senior development director

Organization: SABRE Decision Technologies, Inc.

Project honored: QIK RES, an airline reservation network that saved American Airlines more than $14 million.

Year of award: 1990

Other winner that year: First National Bank of Maryland

"Winning the Network World *User Excellence Award reinforced our belief that well-designed networks add strategic value by reducing workflow cyle time, containing per-unit connection costs, retaining customers and generating external telecom revenue."*

Name and title: Bruce Cavender, manager of network engineering

Organization: Columbia Gas Transmission Corp.

Year of award: 1991

Other winner that year: Texas Instruments, Inc.

"Receiving the Network World *User Excellence Award recognized the efforts Ford and our suppliers have put forth to form tighter links in real time systems while mutually eliminating redundant processes."*

Name and title: Daniel Ryan, DDL, Training Supervisor

Organization: Ford Motor Co.

Year of award: 1992

Other winner that year: Medical Center of Delaware

"Winning the Network World *User Excellence Award was a distinct measure of success for the Iowa Communications Network, which increased our visibility across the state, nation and in foreign countries."*

Name and title: Harold Thompson, chief operating officer

Organization: State of Iowa

Project honored: Iowa Communications Network, a statewide broadband network designed to give users throughout the state access to extensive educational curriculums, medical and governmental services, and judicial functions.

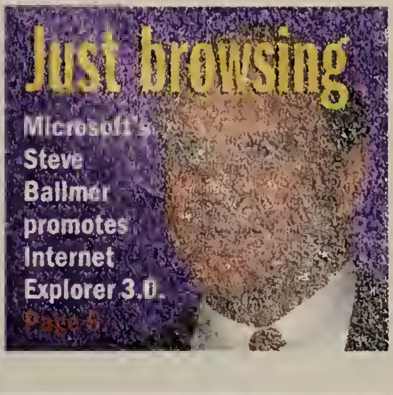
Year of award: 1994

Other winner that year: Hyatt Hotels, Inc.

AUGUST 19, 1996 VOLUME 13, NUMBER 34

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING



Just browsing
Microsoft's Steve Ballmer promotes Internet Explorer 3.0.
Page 6.

CA: At your Web service

Internet Business Unit will provide Web site development and hosting services for both large and small customers.

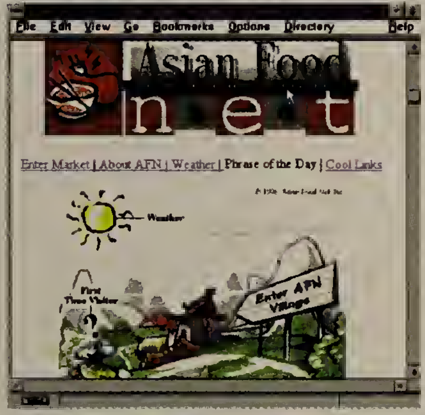
By Doug Barney
New Orleans

Another software giant wants to own a piece of the 'Net. While Microsoft Corp. aims its guns at Internet software, Computer Associates International, Inc. (CA) is looking in another direction — Internet services.

A new Internet Business Unit (IBU), set to be announced at the CA-World '96 show here at the end of the month, is designed to provide Web hosting and development services to large corporations, said sources familiar with the plans. Another effort, called community hosting, will be aimed at smaller organizations.

CA will, however, draw the line at providing Internet access. Instead, sources said the company will leave it up to customers to choose a provider. When it provides content hosting, CA, however, will offer access through a partner such as UUNET Technologies, Inc.

See CA, *page 61*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Enter Market | About AFN | Weather | Phrase of the Day | Cool Links
Weather
First Time Visitor
Enter AFN Village

The Asian Food Net *site, updated last week, was built by CA.*

NSF to test 'Net limits

High-speed research net to be used to test bandwidth reservation, quality of service on 'Net.

By Charles Bruno
Washington, D.C.

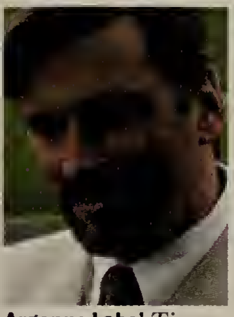
The National Science Foundation last week hatched an aggressive plan to open up a high-speed research network that will serve as a test bed for bandwidth reservation, quality of service and other technologies desperately needed on the commercial Internet.

National Science Foundation (NSF) officials announced plans to broaden use of the very high-speed Broadband Network Service (vBNS), granting awards to 13 research institutions to tap into the network. As many as 35 others are awaiting a decision on whether they will receive grants.

The move initially will appease scientists unhappy with the Internet's performance, and long term may ease the 'Net's growing pains.

"Our hope is this will become a model network where we'll develop and test future technologies that will prove their

See NSF, *page 61*



Argonne Labs' *Tim Kuhfuss says the Internet could use a performance boost.*

BACKBONE BUDDIES

The NSF has granted awards to these research institutions, allowing them to tap into the vBNS:

- Baylor College of Medicine
- Georgia Tech
- Iowa State University
- Ohio State University
- Old Dominion University
- University of California
- University of Colorado
- University of Chicago
- University of Illinois
- University of Minnesota
- University of Pennsylvania
- University of Texas
- Wm. Marsh Rice University

Novell plots intranet domination

By Christine Burns
Burlingame, Calif.

Novell, Inc. is readying an aggressive campaign to help customers build private Webs, a sign that it has no intention of ceding the potentially lucrative intranet market to the likes of Microsoft Corp. and Netscape Communications Corp.

The company will kick off the campaign at a press briefing this week hosted by Chief Executive Officer Robert Frankenberg, at which Novell will demonstrate new intranet products.

Analysts briefed by Novell said the company will likely show components of an intranet product suite it plans to roll out over the next 18 months for customers of NetWare and other platforms, such as Windows NT and Unix. Products planned include:

■ Distributed file and print services accessible through any Web browser.

■ Gateway services that tie corporate intranet users to the Internet.

■ Proxy services that allow managers to control users' access to the Web.

■ A list server that assists in distributing Web content to multiple intranet users.

Novell's goal is to provide its already huge NetWare installed base with an integrated set of tools that give them access to all

See Novell, *page 8*

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Access Network World Fusion using the number in yellow. See page 5 for details.

NETWORLD+INTEROP 96

Gigabit Ethernet proponents plan Interop invasion

By Jodi Cohen
Atlanta

With Olympic athletes having just left and NetWorld+Interop 96 showgoers set to filter in, the hot word around Atlanta is about to shift from gold to gigabit. Gigibit Ethernet, that is.

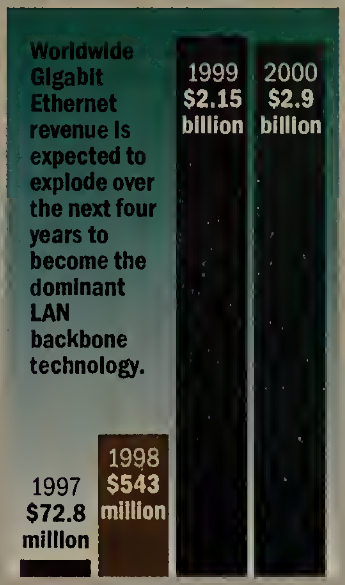
The trade show will serve as a sort of tryout camp for young Gigabit Ethernet players. Analysts said some of the companies will not only be trying to impress customers, but also will be looking to get acquired six or nine months down the road by switch heavyweights such as 3Com Corp. and Cisco Systems, Inc.

"Interop is going to be just like this year's basketball draft, where you had guys selected right out of high school," said Fred McClimans, president of Current Analysis, Inc., a market analysis firm in Ashburn, Va. "It's going to take [young basketball players] a year or two to mature into something, but organizations are willing to take a huge financial risk on them. It's the same thing with Gigabit Ethernet [start-ups]."

A company with a chance to become a first-round draft pick is Alteon Networks, Inc. The

See Gigabit, *page 12*

GIGABIT ETHERNET GROWTH



SOURCE: DATAQUEST, INC., SAN JOSE, CALIF.

Will voice over IP turn the telephony mart on its ear?

By Tim Greene
Simi Valley, Calif.

Penny-pinching network managers looking to cut phone bills have a new tool for running voice virtually free on their data networks. It's called voice over IP.

With the introduction of V/IP Phone/FAX IP Gateway next month at NetWorld+Interop 96 in Atlanta, Micom Communications, Inc.

See Micom, *page 8*

Dial up more info on Network World Fusion including:

- **An article on other vendors' IP-based telephony plans**
- **An overview of efforts to ensure interoperability between Internet and traditional phones**

Select News+.

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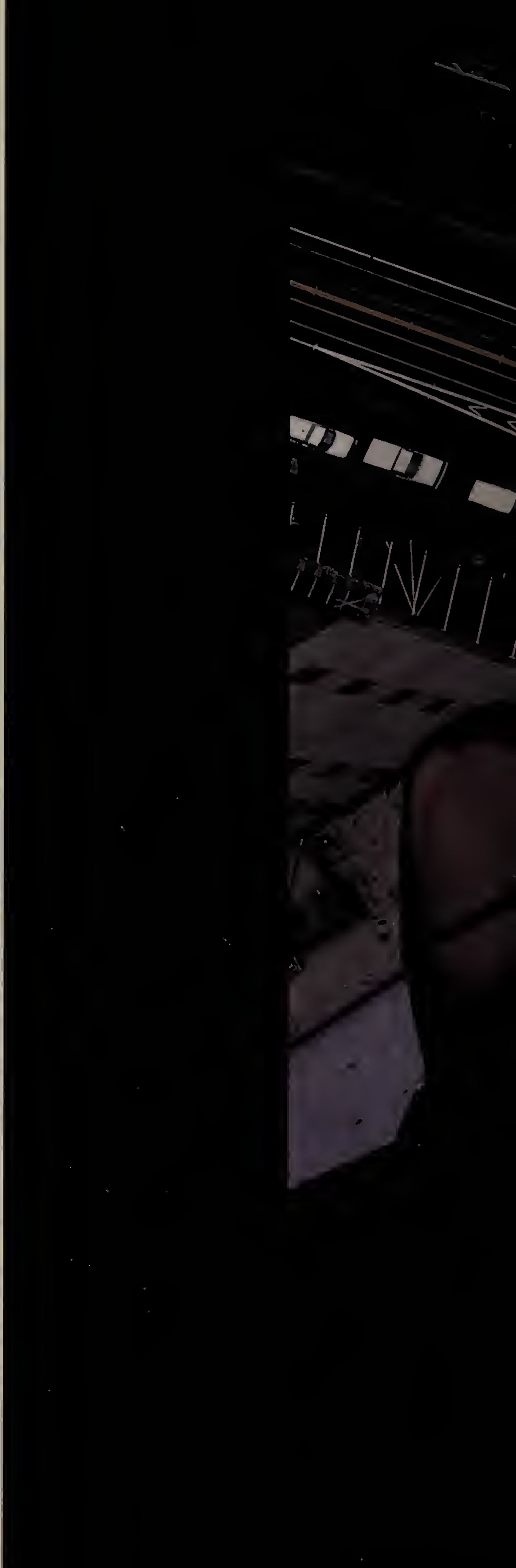

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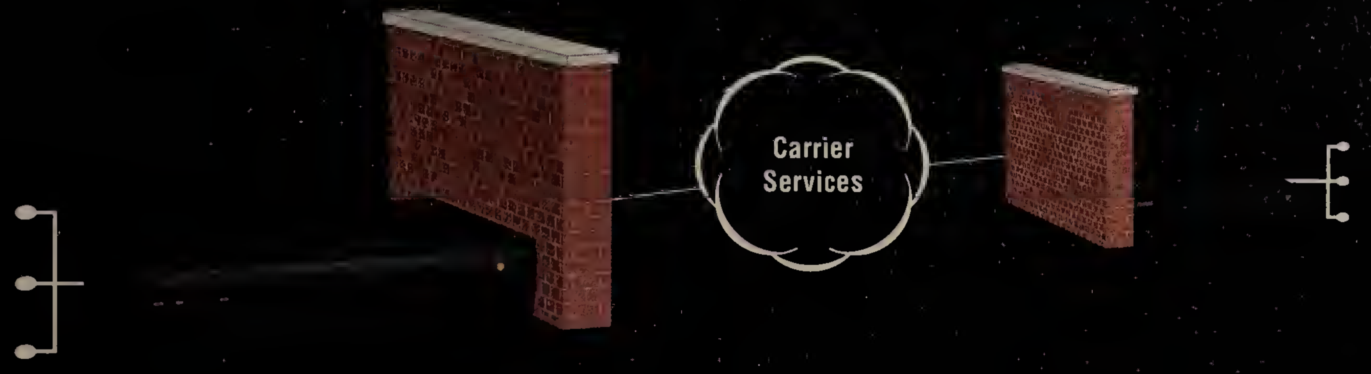

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This Week

News+

- **Web outsourcing:** Computer Associates will be a relative latecomer to Web outsourcing (page 1). See who else is offering to host your Web pages and download our Buyer's Guide to Internet outsourcers.
- **Broadband nets:** You think a T-3 is fast? Read up on proposals for multigigabit networks, such as the I-way effort to link teraflop-speed supercomputers into one seamless whole network.
- **Internet telphony:** To accompany our story on Micom's efforts to provide voice over IP (page 1), see how companies such as VocalTec are providing software to bridge the gap between the Internet and telephones – and how a consortium at MIT is working to ensure interoperability between the two.
- **Telecom reform:** Download a copy of the General Services Administration's report on how the government is saving money with its current telecommunications infrastructure.
- **Application development:** Read about a planned $100 million venture-capital fund for Java start-ups, and download tutorials about Java and its Abstract Windowing Toolkit.
- **Java:** Read how vendors are using Java to link clients to back-end legacy applications.

NetRef

Download complete test results for the three servers reviewed this week. Select Buyer's Guides and Reviews, then Server Test Series.

this week's pick

A team of engineers at the Johnson Space Center in Houston recently evaluated the possibility of replacing the custom-built systems now used to monitor the Hubble Space Telescope with Web browsers using Java applets. You can read a detailed analysis of their prototype, including problems encountered with applets, at http://ccs.gsfc.nasa.gov/ccspages/exchange/cots/java-eval.html.

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NetworkWorld Fusion

CONFERENCE PICK

Hot Topic Read Scott Bradner's comments on VLANs, then add your own 2 cents.

Select Forum, Columnists then Bradner.

NetworkWorld
An IDG Publication

Contents

News

6 **Microsoft and Netscape** launch new browsers.
7 **Cisco rolls out** ATM redundancy products.
7 **Sahara unveils** modular ATM multiplexers.
8 **Web server software strives** to fend off hackers.
9 **IBM moves** net software chief into netcentric guru slot.
9 **Vendors offer** software subscriptions to ease payment for upgrades.
12 **Start-up announces tool** to track Web changes.
12 **Changes to domain name** dispute policy may guard against legal liability.

INS' *Waldbusser pushes Web-based management tools. Page 6.*

WANs & Internetworking

16 **Sterling goes after** TCP/IP management role.
16 **Network probes** reach new areas.

Carrier Services

22 **Enhancements to federal megacontract** could be held up.
22 **MCI's Mexican partner** opens for business.
23 **PacBell action** could slow ISDN competition.
23 **Small ISPs** see worldwide telecommunications carriers as lifesavers.

LAN World

INTEROP '96 NETWORLD+ 10th ANNIVERSARY

25 **Acclaim stakes claim** in LAN/WAN switch market.
25 **Keeping pace** with Novell's changing CNE program.
25 **Vendors rally around** Windows NT with new software.
28 **Newbridge snaps up** French switch vendor OST.

Client/Server Applications

31 **BEA gives a Jolt** to 'Net-based transaction processing.
31 **Microsoft uses** digital signature technology to make Web browsing safer.

Intranets & the 'Net

35 **The fringe parties** on the Web.
35 **Java is forcing developers to learn** new tricks of the trade.

Technology Update

37 **It's your choice:** DLSw or RFC 1490.

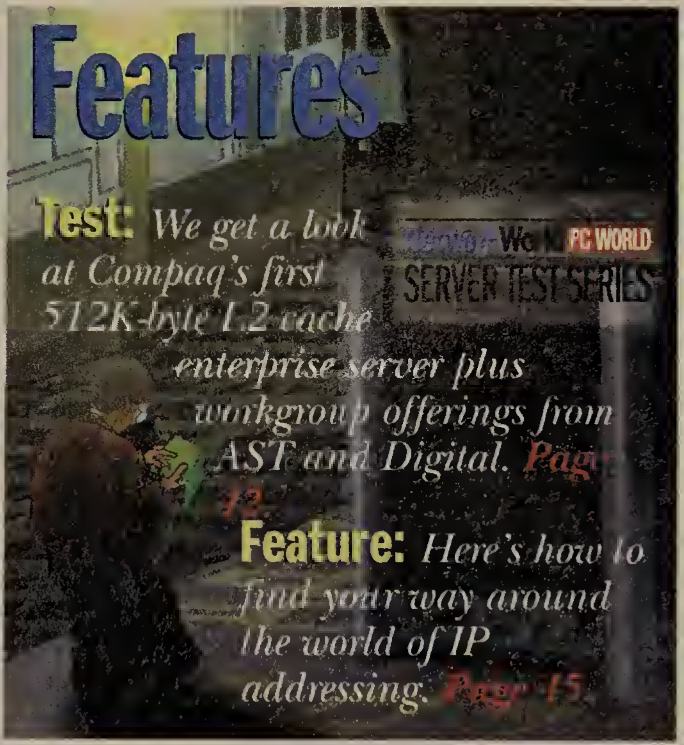
Management Strategies

47 **Avoiding mounds of paperwork** when justifying costs.

Opinions

19 **Scott Bradner** considers the usefulness of VLANs.
27 **Melinda Le Baron and Skip MacAskill** sound a warning about ATM switch upgrades.
28 **Dave Kearns** says Miramar's PC MacLAN software can help Macs and PCs live together peacefully.
34 **Daniel Blum** reviews the Netscape ONE application development plan.
40 **Editorial:** A word to the wise (vendors).
40 **Mary Johnston Turner** says new management skill can help small companies package better.
41 **Kevin Tolly** shows how theory meets reality with ISDN.
62 **Dave Buerger:** What will your business do when the Internet blacks out?
62 **Mark Gibbs:** On being connected, bozos, very hip and browserfication.

Features



Test: *We get a look at Compaq's first 512K-byte L2 cache enterprise server plus workgroup offerings from AST and Digital. Page 12*

Feature: *Here's how to find your way around the world of IP addressing. Page 15.*

Network Help Desk. *Page 37.*
Message queue. Letters to the editor. *Page 41.*
Editorial and advertiser indexes. *Page 60.*

NetworkWorld's *Mission: To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.*

News briefs, August 19, 1996

Party on, Microsoft

Microsoft Corp. this week will throw an online bash to commemorate the first anniversary of its Windows 95 launch. The virtual celebration will feature live chat sessions on the future of Windows and a downloadable special edition screen saver as the party favor. The festivities start Aug. 22 at http://www.microsoft.com.

Oracle to show off for SAP

Oracle Corp. is planning to launch a set of data warehousing tools for use with SAP AG's R/3 applications software next week, the IDG News Service has learned. Oracle will roll out aftermarket products, kits for consultants working with SAP applications and Oracle databases that will "unlock R/3," said Polly Sumner, Oracle's vice president of worldwide business alliances. However, she said the company has not finalized how many products it will announce at Sapphire, the SAP user group conference Aug. 26 in Philadelphia.

Mechaley to keep Wildfire going

Wildfire Communications, Inc. plans to announce today that Robert Mechaley, former AT&T Wireless Services, Inc. senior vice president, has been named Wildfire's president and chief executive officer. The company will also announce it has added 11 service providers that support its Wildfire Electronic Assistant; 33 providers already support the software as a feature option in their networks. The software functions as a sort of electronic secretary for mobile professionals by using speech recognition technology.

Mechaley *takes reins at Wildfire.*

The mother of all arbitrations?

AT&T last week asked regulators in a whopping 20 states to arbitrate local interconnection agreements with GTE Corp. The move continues AT&T's pattern of failing to come to voluntary agreements with local carriers to invade their markets (*NW*, June 17, page 1). Reed Harrison, the AT&T vice president leading negotiations with GTE, said the two carriers agree on some issues but not the "critically important points such as pricing, availability of GTE services, how to connect AT&T's and GTE's networks, and ordering, billing and maintenance processes."

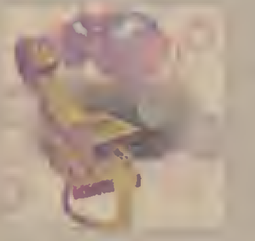
Cisco revisits VLANs

Cisco Systems, Inc. this fall will announce a new release of its VLAN Director software as part of a broader rollout of switched internetworking management products. The application, which a Cisco official referred to as VLAN Director 2.0, will enable users to establish policies for dynamically configuring virtual LANs by port, MAC address or network layer protocol. Currently, VLAN Director statically assigns VLANs by port only and does not support policy-based configuration rules. VLAN Director 2.0 will ship in the first quarter of 1997.

Bay boosts System 3000

Bay Networks, Inc. last week rolled out extensions to its System 3000 hub. These include a new chassis configuration and upgrade kit that support Ethernet, Fast Ethernet and token ring; two Fast Ethernet modules; a network management agent module; and a 24-port Fast Ethernet bundle. The chassis and upgrade kit cost $2,695 and $995, respectively. The Fast Ethernet modules cost $1,995 and $2,495. The network management module costs $3,495, and the 24-port bundle costs $7,485.

Ameritech Dial-s for help



They said someday telecom services would be marketed like soap, but it was just a metaphor. Soon it will be the literal truth. Ameritech Corp. last week announced that Andrew Patti, currently president and chief operating officer of Dial Corp., will join the telephone company Sept. 1 to head its marketing and business development organization.

Web to keep eye on network performance

INS and Platinum roll out services and tools for Web-enabled management.

By Jim Duffy
Boston

Two network management vendors last week unveiled Web-enabled products and services to help users better gauge the performance of their enterprise networks.

At Network World's Managing Enterprise Networks & Systems Conference here, outsourcer International Network Services (INS) rolled out a new version of EnterprisePRO, a network performance management service that lets users access real-time performance metrics and long-term history from a Web browser.

INS' *Waldbusser plugs Web-based management.*

At the same time, Platinum Technology, Inc. unwrapped two products — TransTracker and WireTap — for transaction measurement and performance monitoring of networks, databases and servers, including Internet/intranet servers.

EnterprisePRO Service Release 3.0 combines an intranet Web server and network data collection device. The service tracks the performance of frame relay circuits, WAN links and LANs.

EnterprisePRO 3.0's intranet server is a multithreaded polling engine that collects network traffic information continually by polling network devices every five minutes.

This enables clients to quickly identify network performance trends, troubleshoot problems, anticipate bottlenecks and verify carrier service-level agreements, INS said.

"The Web is an excellent management station-to-user interface that gets beyond the traditional [management platform] model where it's hard to distribute information," said Steve Waldbusser, principal architect in INS' electronic services division.

"One of the problems we used to have was, because everything was based on Unix and X Windows terminals, it was hard to have it at people's desks," said Michael Del Secolo, senior director of communications engineering at ADP Corp. in Roseland, N.J.

"With the intranet, I distribute [INS data] to all my users and anyone using a browser gets the network information. It now becomes geographically independent," he said.

A single EnterprisePRO server monitors over 5,000 interfaces.

EnterprisePRO 3.0 is available now at a starting price of $30,000 per year.

On your own

For users opting to manage network performance themselves, Platinum's TransTracker and WireTap software products may help.

TransTracker collects transaction-level resource metrics, including all database, server and network processes that make up a transaction, down to the SQL statements used to execute these processes.

TransTracker then correlates the data into an integrated view of resource consumption.

WireTap captures and analyzes network traffic. It provides a view of overall network resource utilization and response times for application transactions such as Web page hits, so users can plan network capacity and reconfigurations.

TransTracker costs $35,000 and will ship next month. WireTap will ship in the fourth quarter.

Pricing has not been determined.

©INS: (888) 467-8100; Platinum: (800) 442-6861.

Microsoft, Netscape step up battle on Web browser front

By Carol Sliwa

Pick a war metaphor, any war metaphor, and inevitably, it will fit the Microsoft Corp.-Netscape Communications Corp. Internet battle.

The companies have been sniping at each other for months, and Microsoft has now moved in with the heavy artillery, dropping bomb after bomb as the cash-poorer, undermanned Netscape tries its hardest to dodge the onslaught with pesky guerilla warfare tactics.

Netscape today will begin shipping its Navigator 3.0 Web browser, a week after Microsoft launched its Internet Explorer 3.0, which adds support for Java and ActiveX, among other things. Explorer was introduced by Chief Executive Officer Bill Gates at a San Francisco soiree and by his lieutenants, who hosted more than a dozen events in major cities around the U.S.

Just how far will Microsoft go to cut into its rival's market-share lead, estimated to be as high as 85%?

Microsoft's *Ballmer says, "Netscape competes with Windows."*

For starters, the company has persuaded just about every major Internet service provider to distribute their free browser.

To further entice customers to make the switch, Microsoft has shelled out money for popular Internet subscription services,

See **Browser**, *page 13*

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Sahara pulls covers off ATM muxes

By Tim Greene
Wallingford, Conn.

Start-up Sahara Networks, Inc. next month will debut its first products — a line of inexpensive ATM multiplexers that support virtually any mix of traffic.

The company's Sahara Access series, to be introduced at NetWorld+Interop '96, are designed to protect customers' hardware investments while giving them flexibility about what kind of WAN links to use.

While the devices will let customers consolidate data, voice and video traffic for transmission over any dedicated wide-area transport — circuit, frame or ATM — they are primarily seen as ATM muxes.

A technology called Cross Flow Switching allows efficient conversion between traffic types. For example, 100M bit/sec Ethernet-to-ATM conversion can be done fast enough to establish a wire-speed wide-area link, the company said.

That flexibility and a price 15% to 20% below competitors' make the Sahara devices potentially popular, said Thomas Nolle, president of CIMI Corp., a technology assessment firm in Voorhees, N.J. ADC Kentrox, Cell Access, OnStream Networks, Inc. and NetEdge Systems, Inc. are among the competitors.

Cards for the modular Sahara boxes, which are available in three models (see graphic), are powered by processors that enable simultaneous switching of cells and frames at 1G bit/sec each.

The cards deliver full standard RFC 1490 frame relay to RFC 1483 ATM interworking. They also support different classes of ATM service — constant bit rate, variable bit rate, available bit rate and unspecified bit rate — that let customers prioritize traffic, among other things.

The object-oriented, component-based software that controls the modules provides users and developers with the opportunity to customize applications easily, as well.

The cards themselves are modular, each having space for two interface protocol option devices (IPOD) with one to four ports, and a third expansion IPOD that generally offers fewer ports.

That flexible architecture should stand them in good stead in an unpredictable ATM market, Nolle said.

Management of the devices is done through Sahara View, which is based on Web agents embedded in each box and accessed via any Java-enabled Web browser (*NW*, Feb. 12, page 1).

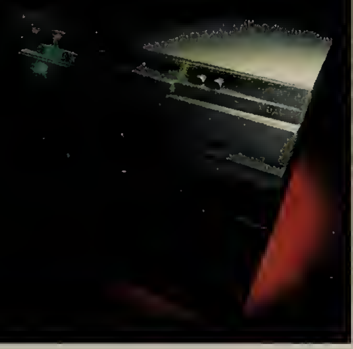
The products range in price from $8,000 to $100,000 and will be available by year-end.

©Sahara: (203) 284-4100.

SAHARA'S BROADBAND ACCESS OFFERINGS

Available interfaces: DS-1, DS-3, OC-3, STM-1 ATM; DS-1 ATM inverse multiplexing; DS-1 circuit switching; DS-1, DS-3, HSSI frame and packet; Ethernet; video.

Product name	Features	Price
SA-100	One-slot for a module with up to three user-side ports and one WAN port.	$8,000 to $25,000
SA-600	Three slots for user modules, two slots for modules used by carriers to manage links, etc.	$20,000 to $45,000
SA-1200	Six slots for user modules, four slots for carrier modules.	$30,000 to $100,000



Cisco backs up ATM LANE

By Jim Duffy
San Jose, Calif.

Don't bury ATM yet.

Even though Fast Ethernet is filling backbone risers and Gigabit Ethernet is right around the corner, Cisco Systems, Inc. is still intent on ruggedizing ATM for production use. The company last week rolled out software and hardware for building fault tolerance and redundancy into LAN Emulation (LANE)-based ATM networks.

"Redundancy really hasn't been looked at," said Jeremy Duke, senior analyst at In-Stat, Inc. in Scottsdale, Ariz. "If ATM is going to become accepted in the marketplace, it needs to be a little more stable than it presently is."

Cisco unveiled the Simple Server Redundancy Protocol (SSRP), an enhanced version of its Hot Standby Router Protocol (HSRP) and the ATM Forum's Private Network-to-Network Interface (P-NNI) software. Cisco also rolled out a new ATM LANE module for its Catalyst 5000 workgroup and backbone switch.

SSRP provides redundancy for all of the server components in LANE — the LAN Emulation Configuration Server (LECS), the LAN Emulation Server (LES) and the Broadcast and Unknown Server (BUS). LANE clients use these servers for LAN address-to-ATM address resolution and forwarding broadcast and multicast traffic over an emulated LAN.

SSRP allows network managers to deploy multiple LECS and LES/BUS components in a backup scheme for a given set of emulated LANs. SSRP interoperates with any ATM LANE 1.0-compliant client, Cisco said.

HSRP is a LANE-optimized version of HSRP, a two-year-old protocol for kick-starting a backup router if the primary device fails (*NW*, June 24, 1994, page 7). HSRP for LANE will provide this level of router redundancy for VLANs, Cisco said.

P-NNI, the ATM Forum-specified call routing protocol, enables multiple, redundant ATM links to be configured between switches. This allows network administrators to load share their traffic over multiple ATM links while ensuring the remaining links act as backups, Cisco said.

Lastly, a new version of the ATM LANE module or the Catalyst 5000 features dual physical-layer interfaces for link redundancy.

SSRP and HSRP for LANE will be available in September in Release 11.2 of IOS. The dual physical layer ATM LANE module will ship in October. It is priced from $8,995 to $14,995.

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Web server software looks for trouble

By Ellen Messmer

Atlanta

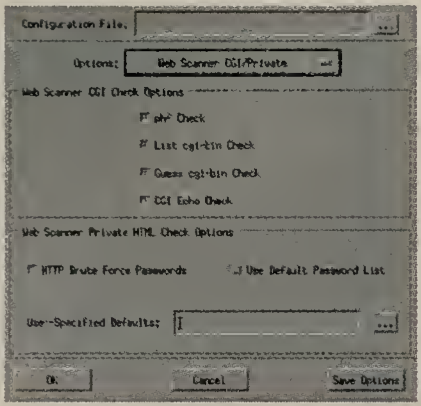
Internet Security Systems, Inc. this week will begin shipping Web Security Scanner, software that sits on a Web server and lets users check for 100 known security soft spots.

The software, available for Windows NT and Unix machines, runs automated probes to test for holes in Common Gateway Interface (CGI) scripts that let hackers break into Web servers and pillage hard drives for password-protected pages.

The scanner runs tests such as pinpointing whether a Web server displays the index.html directory — the cover for all Web subdirectories, according to Christopher Klaus, founder and chief executive officer of Internet Security Systems.

"Companies have been known to store credit card numbers from Web customers in a subdirectory," Klaus said. "They thought no one could get in there because there were no links."

The security software will also simulate brute-force attacks on passwords protecting individual Web pages, and check for common Internet TCP/IP attacks related to remote login and IP spoofing. Test results are collected in a directory on the Web server in HTML format and can be viewed via a browser.


Configuration File:
Options: Web Scanner CGI/Private
Web Scanner CGI Check Options
phf Check
List cgi-bin Check
Guess cgi-bin Check
CGI Echo Check
Web Scanner Private HTML Check Options
HTTP Brute Force Passwords
Use Default Password List
User-Specified Defaults:

The Web Security Scanner *tests the configuration of intranet and Internet Web servers for hacker vulnerabilities.*

Neal Mackanic, computer scientist at Lawrence Livermore National Laboratory, has been beta-testing the Web scanning software at the Livermore, Calif., installation, where 7,000 employees make use of about 100 Web servers of every type.

"It takes a certain level of understanding to use this product, but it's helpful in identifying high-risk vs. low-level vulnerabilities," Mackanic said.

Information Security Systems is offering the Web scanner for $99 for 90 days, with the cost going up to $495 thereafter.

©Internet Security Systems: (770) 395-0150.

Novell

Continued from page 1

the information and services Web technology has to offer. The company also wants to rein in new intranet customers with mixed NOS environments.

Analysts said Novell has gotten off to a slow start in the intranet market and needs to get aggressive.

"In a market that is moving as fast as this one, Novell can't afford to be late. They need to be at the front end of the wave," said Rob Enderle, an analyst with Giga Information Group in San Jose, Calif.

"In a market that is moving as fast as this one, Novell can't afford to be late. They need to be at the front end of the wave," said Rob Enderle, an analyst with Giga Information Group.

"They can't keep looking like they are always trying to play catch-up with Netscape and Microsoft," he said.

While Novell has been slow to announce a comprehensive intranet strategy, it has made some headway in terms of developing and marketing Web tools and services through its Internet/Intranet Business Unit formed in February.

The company will include improved server-based TCP/IP services and a revved up Web server with its upcoming NetWare 4.11 release.

Additionally, Novell has announced plans to provide Lightweight Directory Access Protocol support, an emerging standard for common directory services access, in its Novell Directory Services by year-end.

Mike Nelson, director of strategic communications, confirmed that Novell will be announcing the first of several intranet products that will be both standards-based and run across multiple platforms such as Windows NT and various flavors of Unix.

However, he declined to release further details on the products themselves or how they might be bundled together for delivery.

Rick Villars, director of network software research at International Data Corp. in Framingham, Mass., said how Novell packages these new intranet services will be as important as the underlying technology.

"Novell made its name by selling solutions. The technology is there, but the main selling point was that it was put together in the right package. . .one that resellers could then turn around and sell to end users as a turnkey solution," Villars said. "That is what Novell has to do with the intranet if they are going to beat the competition," ■

Micom

Continued from page 1

blazes new territory by building on its experience with voice-over-frame relay. A free ride for voice on data networks excites users, but they are leery of quality.

"Free voice" options

Data networks are all offering users the option to pull intersite phone calls off the public switched telephone network.

ATM: Good-quality voice, but ATM private networks are scarce.

Frame relay: Voice quality is good and improving, and carriers are offering transport fine-tuned to handle voice. Frame relay nets are widespread.

Internet: This is a toy until delay and voice-quality problems are overcome.

Private IP: New and unproved, it can ride any IP transport and promises to remove the delay-oriented drawbacks plaguing Internet phone.

Voice over IP is the latest option users have for saving money by pulling traffic off the more expensive public switched telephone network.

"This whole area is going to explode over the next few years," said Dave Jensen, the manager of network engineering and planning at George Mason University in Fairfax, Va.

"I like any alternative for migrating these independent networks onto one," said Jeffrey Fritz, telecom manager at West Virginia University. "It's ridiculous to run multiple simultaneous networks."

And the technology also suports fax. "Now there's a good application. That's where we could save big time," said Steve Rosenfeld, manager of communications and computer services, University of Texas, El Paso.

While there are many factors to weigh and test before diving in headfirst, the potential cost savings is worth looking at now, according to Phil Evans, director of telecommunications at Perot Systems Corp. in Dallas. "It's very intriguing," he said.

Micom claims V/IP offers real-time, toll-quality voice while eating up only an average 6K bit/sec per voice channel. It's projections call for a 15-month payback on the typical system.

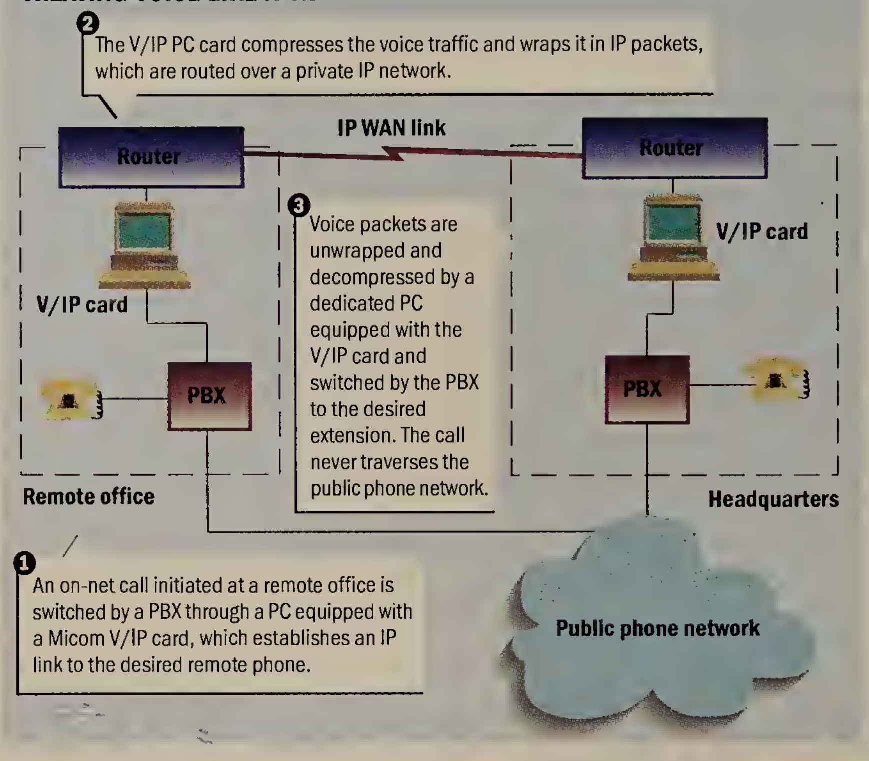
One industry source who asked not to be named said carriers will respond to IP voice by selling it at a discount, with the understanding that quality might be lower than switched voice.

While Micom is the first big name in the market, start-up Vienna Systems, Inc. of Kanata, Ontario, will announce an IP phone product within weeks. VocalTec, Inc. and Northern Telecom, Inc. are said to be working on IP voice products.

Voice quality and ease of use are paramount concerns, according to Ruth Michalecki, director of telecommunications at the University of Nebraska.

End users within private organizations will want familiar dialing patterns and will not tolerate delays that reduce the pace of conversation to that of a two-way radio link.

TREATING VOICE LIKE A VIP



① An on-net call initiated at a remote office is switched by a PBX through a PC equipped with a Micom V/IP card, which establishes an IP link to the desired remote phone.

② The V/IP PC card compresses the voice traffic and wraps it in IP packets, which are routed over a private IP network.

③ Voice packets are unwrapped and decompressed by a dedicated PC equipped with the V/IP card and switched by the PBX to the desired extension. The call never traverses the public phone network.

Other factors include whether IP voice packets will interfere with data traffic the IP networks were designed to handle. Similarly, bursts of data could garble voice connections.

Micom's V/IP consists of PC cards and software, and supports DOS or NetWare. The user needs one ISA slot in a 386-or-better PC, and a PBX or key set at each remote site on the corporate network, plus a dedicated PC at the central site.

The remote PCs each take a V/IP one- or two-channel PC card, and the dedicated PC at the central site takes a T-1 card or as many cards as it needs to handle the remote offices. At all sites, the V/IP-enabled PCs are connected to the PBX or key set.

Users dial "6" plus a seven-digit extension on their standard phone set. The local PBX switches to the V/IP card that packetizes and compresses the signal. It is routed to the destination site, unwrapped and dropped on the PBX, where it is switched to the dialed extension.

Delays are prevented by using existing priority protocols in Cisco Systems, Inc., 3Com Corp., Bay Networks, Inc., Advanced Computer Communications and Ascom Timeplex, Inc. routers, according to Ken Guy, Micom's vice president of mar- keting. V/IP will also support Resource ReserVation Protocol, a bandwidth reservation scheme Cisco routers will support next month.

A one-port V/IP card costs $1,050, a two-port costs $1,750, and a T-1 card supporting 24 channels costs $18,490.

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EVERYBODY'S THINKING INTRANET

Through a survey of users at 400 of the Fortune 1000 firms, researchers at the Boston-based Delphi Consulting Group, Inc. found that 90% of these organizations are currently evaluating comprehensive intranet strategies.

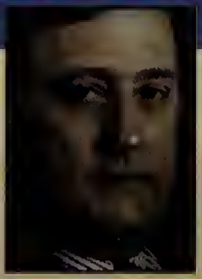
IBM redirects software strategy

In an effort to focus software development in preparation for future battles, IBM last week folded its Networking Software Division into its Software Solutions Division.

In the process, the company also promoted Don Haile, general manager of its Networking Software Division, to general manager of technical strategy for the software division.

The move places Haile out in front of an arena IBM considers crucial for future success. Senior Editor Michael Cooney a spent a few moments with Haile going over what this all means and his plans for the new position.

Who is Don Haile?



- Last week he was named IBM's general manager of technical strategy.
- A 32-year IBM veteran, he joined the company's Endicott, N.Y., facility after receiving an electrical engineering degree from Penn State University.
- He has held positions in software development, telecommunications, systems management and operating systems development.
- He was named general manager of Networking Software Division in November, 1993.
- He joined IBM's Worldwide Management Council in 1994.

What is your agenda in the new post? What do you hope to achieve?

The ultimate idea is to focus our software efforts. We don't need to be shooting 14 arrows at a problem when one big missile would do. We have so many products and parts that our message doesn't always come across clearly. We need to define exactly what we are doing and implement it precisely; we haven't always done that in the past.

What are your priorities?

We want to focus on the things that are working well for us and expand on them. For example, our MQ Series technology is hot at the moment.

We want to expand that and drive it to more platforms and make sure that all of our products are taking advantage of that technology. Transaction processing is another strong area; we will make sure that continues to grow. Object-oriented management is another priority.

You'll see us do more with Java and VisualAge. And the strategy of successfully moving our SNA users to the new world is always important.

What areas do you feel IBM has to excel in to be successful in the networking arena?

I think we already have a strong blueprint in place, but looking across our product line, I think we need to improve our overall cross-platform support of Internet and Java technologies. We need to work closer within our own divisions to bring technology together more quickly.

We need to focus on making OS/2 a strong server platform, and we need to determine what we're going to do with technologies such as Microsoft's OLE (now largely known as ActiveX). We'll be working to implement IP Version 6 in products, and we'll continue to drive our own Internet browser development.

Do you think IBM is willing to take risks now with new, sometimes unproven, partners or technology it wouldn't have in the past?

Yes, but we need to do that to strengthen our portfolio. You'll continue to see us ally with more companies because we've determined that is the best way to bring industry-leading technology to the table quickly. Change sometimes hurts your head but sometimes you have to do it.

If you could explode a few myths about IBM software, what would they be?

One would be that the Internet is going to eat Lotus Notes' lunch. That is just so far from reality. Another is that the centralized computing structure is going away. That too is ridiculous. It may be a big cluster now, but the idea of centrally controlling distributed environments is alive and well. ■

Purchase strategies

Software subscriptions catching on

By John Cox

You get your newspapers and magazines — even *Network World* — via subscriptions. So why not your corporate software?

A growing number of software vendors are touting the benefits of buying their products with a guarantee of future upgrades — delivered via the Internet — included in the price.

For corporate network and MIS groups, this practice can simplify software budgeting and upgrade planning.

It can also ensure that those customers who require the latest features will get them. But network and MIS managers should keep a calculator handy along with a set of questions to help decide whether a software subscription will pay off and whether the vendor can really deliver.

And many corporate developers are rightly wary of automatic changes to their tools through subscription releases, because those changes can play havoc with the software quality-assurance process.

Vendors like the subscription approach because they can take in more revenue up front, said Tom Murphy, a product-line manager with ParcPlace-Digitalk, Inc., a Sunnyvale, Calif, development tools vendor that is considering offering software via subscriptions.

Subscriptions also appeal to vendors because they let them keep ahead of customer demand for new features — especially for Internet-related products — and deliver those features faster and more simply than under traditional maintenance contracts.

Vendors usually charge more for the subscription than for the cost of a one-time purchase. How

See Subscribe, *page 13*

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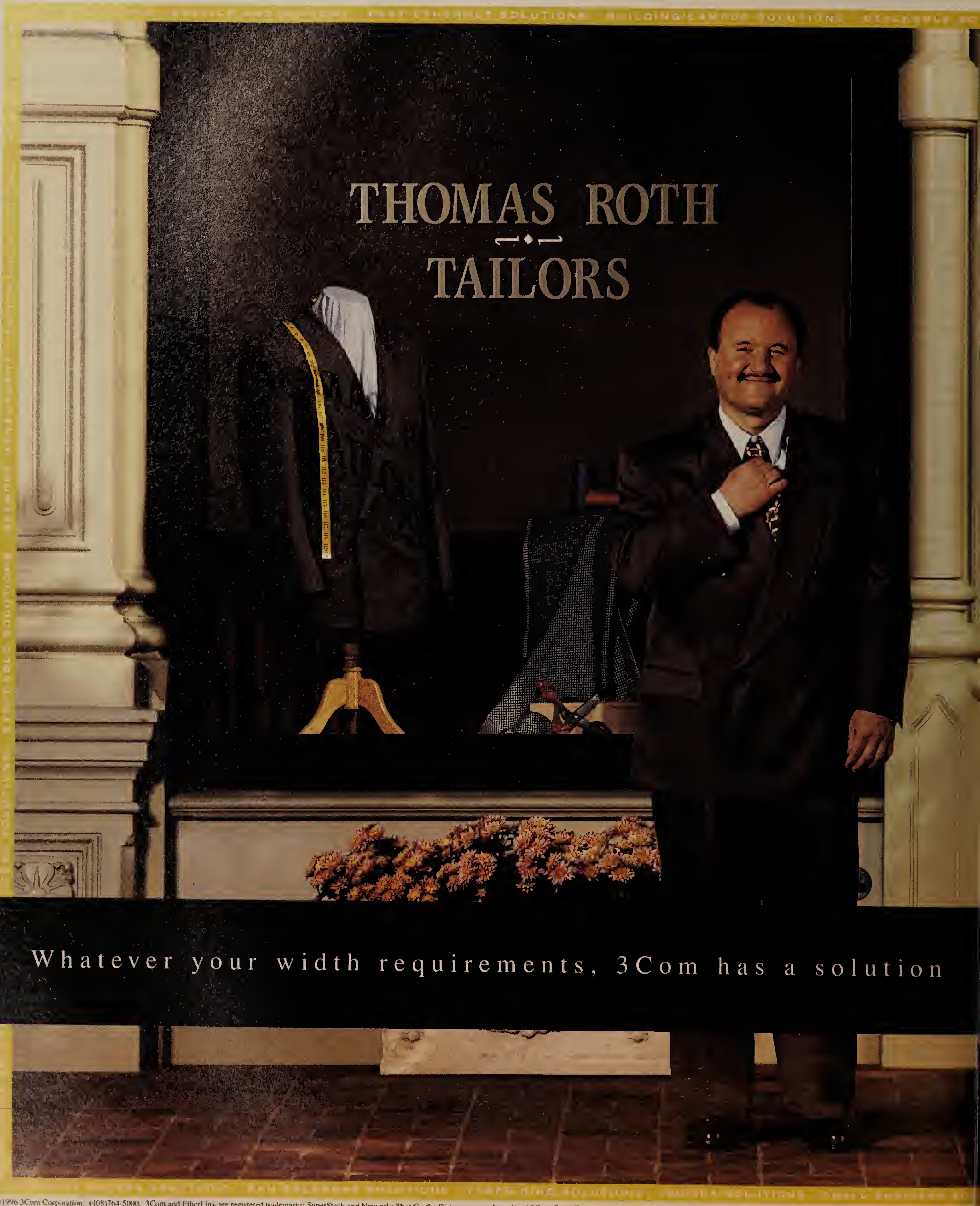
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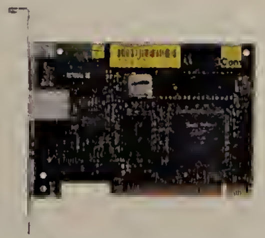
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NETWORKS THAT GO THE DISTANCE

Circle Reader Service #**35**

Software captures Web highlights

Tierra's product will monitor, retrieve and emphasize data from the World-Wide Web.

By Carol Sliwa

Have idea, will travel.

A 20-year-old who was building Web sites in California, far from his eastern Canada home, figured there must be a better way to get information updates from the Internet. So Matthew Jackson shared his idea with his mother's boyfriend, a college professor in Ottawa.

The professor just so happened to remember this brainstorm over a game of golf with a friend from the high-tech industry. The result?

They raised $1 million from private sources, hired software engineers from Corel Corp. and Fulcrum Technologies, Inc., and presto: Jackson's idea became a floppy disk.

So this week, Tierra Communications, Inc. is launching Jackson's brainchild, a software product called Highlights that will monitor, retrieve and highlight information from the Web.

Users configure agents, which Tierra calls assistants, to monitor Web pages on a schedule that they specify. They can choose to receive updated information from an entire site or just the documents containing certain key words that they specify.

A narrow vertical bar at the left side of a computer screen displays the list of sites being monitored. A checkmark appears whenever the updated Web site information arrives, and a T in the lower right corner changes from white to blue.

The user simply clicks on the box to retrieve the updated information, which has been stored on the computer's hard drive and can be viewed online or offline.

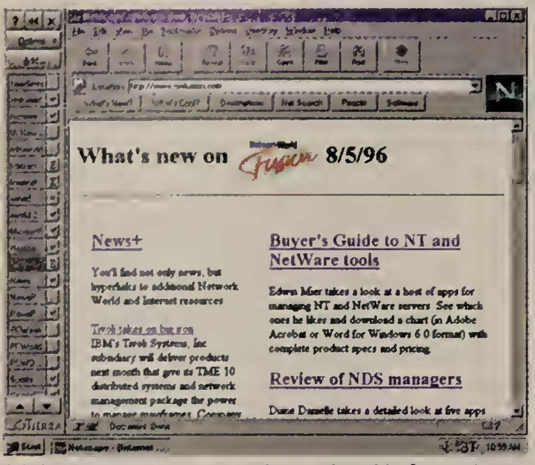
"The goal of Tierra is to make the Internet a useful business tool," said Joanne Correia, the company's director of marketing.

Plans call for future versions of the product to allow the grouping of Web sites into categories, such as news or commerce. The company also is considering a corporate version that would allow defaults to be set up for controlling a user's monitoring. The client-based Highlights software, which runs only on the Windows 95 platform, can be purchased for $34.95 beginning Sept. 1.

A free one-month trial version can be downloaded from Tierra's Web site at www.tierra.com.

Tierra is currently testing a Windows NT version.

©Tierra: (888) 843-7720.



What's new on Fusion 8/5/96

News+

You'll find not only news, but hyperlinks to additional Network World and Internet resources

Buyer's Guide to NT and NetWare tools

Edwin Mier takes a look at a host of apps for managing NT and NetWare servers. See which ones he likes and download a chart (in Adobe Acrobat or Word for Windows 6.0 format) with complete product specs and pricing.

Review of NDS managers

With Highlights, *users receive updated information from Web sites. A checkmark denotes an updated site.*

Gigabit

Continued from page 1

San Jose, Calif.-based start-up will make its debut at the show and announce plans to roll out 1G bit/sec Ethernet switches as well as network interface cards (NIC) by year-end. The NICs will be demonstrated in the show's InteropNet, a multivendor network designed to showcase different technologies.

Alteon's Gigabit Ethernet gear will mimic products first introduced at the 100M bit/sec level, according to Steven Strom, director of product marketing at the company.

"There will be switches that offer 100M bit/sec switched links with 1G bit/sec uplinks for servers or backbone connections, just like the 10/100M bit/sec switches that are on the market today," he said. "There will also be pure Gigabit Ethernet products to tie all of these devices together."

Gigabit Ethernet gives customers a high-speed LAN backbone option that does not require them to learn a completely new technology, such as ATM.

"Gigabit Ethernet and ATM are as complementary as Ethernet and token ring," Strom said. "Sure, they can be used for different purposes, but people will generally choose one or the other."

Strom said he is "astounded" that vendors are proposing ATM backbones within what are currently all-Ethernet environments. Gigabit Ethernet is a better fit, he said.

Trudy Barker, director and principal analyst at Dataquest, Inc., a market research firm in San Jose, Calif., agreed. "Barring any lurking killer application for ATM, Gigabit Ethernet will become the dominant backbone technology," she said. "But that doesn't mean that there's doom and gloom ahead for ATM. We believe that it's a horse race with ATM coming in a close second."

Alteon, which is backed by about $4 million in venture capital funding, is also evaluating Gigabit Ethernet interfaces for routers and feeder nodes, as well as other products. The company's president is Mark Bryers, formerly with high-speed LAN pioneer Ultra Network Technologies, Inc.

Start-ups expected to join Alteon at Interop — most likely to be found hanging out at the Gigabit Ethernet Alliance booth — include Granite Systems, Inc., Packet Engines, Inc. and Prominet Corp.

Showgoers can also expect to see Gigabit Ethernet gear on display from the more established players. Cabletron Systems, Inc. will demo a one-port Gigabit Ethernet uplink module for its high-end Multi Media Access Center-Plus (MMAC-Plus) switching hub. Separately, NBase Communications will show off a two-port Gigabit Ethernet uplink module for its MegaSwitch II 10/100M bit/sec Ethernet switch. Both companies' products will ship by year-end.

But for those companies looking to catch the eye of a potential acquiring vendor, it's not necessary to show off many — if any — products at Interop to get noticed. In fact, one analyst said that having finished Gigabit Ethernet gear could actually hurt a start-up's chances of being acquired.

"It could be a significant disadvantage for a vendor to walk in with a completely functional product line of Gigabit Ethernet technology, unless they built it in such a way that they can easily reconfigure it to mesh with an acquiring vendor's existing switch architecture," McClimans said.

However, Barker warned that most of the big players will already have products out once the market starts to heat up. "A lot of the start-ups are going to be profoundly disappointed when the time comes to sell out to the big companies," she said. "There are too many start-ups chasing too few acquisitions." ■

CHECK OUT THESE GIGABIT ETHERNET SESSIONS AT INTEROP

NETWORLD+INTEROP 96 10th ANNIVERSARY

Reality Check: 622M bit/sec ATM vs. Gigabit Ethernet
Birds of a Feather session
Sept. 18, 8-10 p.m.

Gigabit Ethernet technology and implementation
Chaired by Tam Dell'Oro of the Dell'Oro Group
Birds of a Feather session
Sept. 19, 8-10 p.m.

Gigabit Ethernet: The next campus backbone of choice?
Chaired by Tony Rybczynski of Nortel Multimedia Labs (panel members Tony Lee, chairman of the Gigabit Ethernet Alliance; Paul Krystosek, Argonne National Labs; and Fore Systems's Joe Skorupa)
General conference session
Sept. 20, 10:15-11:45 a.m.

NSI announces changes to domain name dispute policy

By Chris Nerney

Herndon, Va.

Pending changes to Network Solutions, Inc.'s domain name dispute policy are designed to further insulate NSI against legal liability and cut down on frivolous challenges to current domain registrants by companies alleging trademark infringement, an NSI spokesman said.

The revised policy — announced last week and effective Sept. 9 — includes a new clause that requires parties claiming trademark ownership to notify domain name registrants about their claim before taking the matter to NSI, said NSI spokesman David Graves.

Graves said this will help protect domain name registrants from being blindsided by trademark infringement allegations and force the parties in question to deal with each other rather than rely on NSI to render judgments about domain names.

NSI is the domain registrar for the Internet Network Information Center (InterNIC) under a cooperative agreement with the National Science Foundation.

Many domain name holders have claimed NSI has been too quick to suspend use of domain names in response to pressure from large corporations that claim trademark violations.

The revised policy adds a requirement that companies and individuals offer NSI certified proof of trademark ownership before NSI will consider suspending — or putting "on hold" — a domain name.

Graves said that while it has always been NSI's policy that it was not an arbiter of domain name disputes, it nonetheless has found itself named in lawsuits filed by parties alleging trademark violations.

The new policy emphasizes that the two parties must resolve their dispute and agree to be bound by either a negotiated settlement or a court order — and that NSI also would abide by any court decisions.

"We're just trying to make [our position] more explicit," he said.

The new revisions also "close the loophole of last-minute, instant trademarks," which some businesses have tried to offer as legal evidence that they own the rights to a domain name, Graves said.

Now companies must offer evidence that their trademark was registered before the domain name in question was in use.

The domain name dispute policy, enacted in July 1995, was first revised last November.

Graves said it has always been NSI's objective to make revisions to the domain name dispute policy "when appropriate."

"These changes are based on experience," he said. ■

NetworkWorld Fusion

Read more on Network World Fusion about domain name disputes and NSI policy, including:

- **Latest NSI policy revisions**
- **Recent domain name battles involving Sun Microsystems and Java-related sites**
- **Georgetown University Law School site chronicling greatest domain name fights of all time**

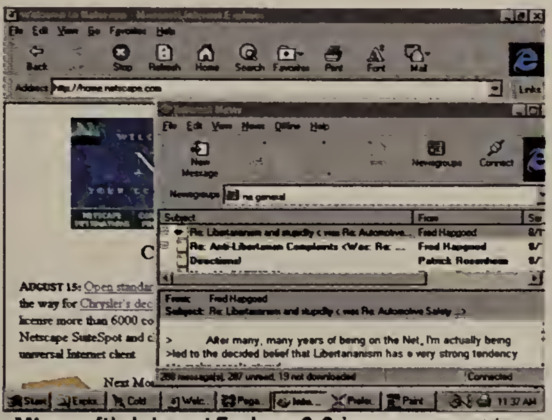
Select News+.

(http://www.nwfusion.com)

Browser

Continued from page 6

such as The Wall Street Journal Interactive Edition and ESPNET Sportzone. These are available free to anyone who downloads Explorer 3.0.



Microsoft's Internet Explorer 3.0 *became available at midnight last Monday for the Windows 95 or NT platform.*

Like Kmart at Christmas, Microsoft conducted a Midnight Madness promotion, showering early downloaders with everything from glow-in-the-dark T-shirts to a multimedia notebook computer.

"What's next, $100 gift certificates on the Home Shopping Network?" cracked industry analyst David Smith of Stamford, Conn.-based Gartner Group, Inc.

In Boston, Microsoft wined and dined prominent chief information officers over lunch, moments after a breakfast session with its New England development partners broke up nearby at the tony Park Plaza Hotel.

But the company did not stop there — it tried to cajole the entire city of Boston to download Internet Explorer.

Every free Internet Explorer download loaded from Boston.com's Web site before year-end will translate to $1 worth of free Microsoft software for the city's schools.

Clearly, this browser market-share war has become important to Microsoft.

"Windows is our core product, and Netscape competes with Windows," said Steve Ballmer, Microsoft executive vice president.

Two-year-old Netscape does not command the resources to stage the type of promotions that its 21-year-old rival does. Through cheaper means such as its highly visited Web site, Netscape will orchestrate its counteroffensive.

One new twist will be Inbox Direct, a Navigator 3.0 feature for getting Internet E-mail updates from a variety of popular Web sites in HTML page format, replete with graphics, sound and video.

From a Destination box in the browser, users can surf to a participating content provider, fill out a form and register to receive updates from the site, Netscape officials said. Users will be able to specify when they want the sites monitored and what type of information they want to receive.

Sites on board at press time included *The New York Times, C/Net, Hot Wired* and various International Data Corp. publications.

"It's a nice way to package information and deliver it to yourself," said Ira Machefsky, an analyst with Giga Information Group. "Hopefully, it will be a better way for enterprises to manage their intranet resources and optimize that use by shifting utilization to off-hours."

With the new 3.0 browsers nearly equal in features, these add-ons are becoming the new battle front. ■

Microsoft backs down – for now

Aug. 15 came and went without anything happening in the legal imbroglio between Microsoft Corp. and Netscape Communications Corp.

Microsoft, in a sternly worded letter dated July 30 from its legal department, demanded rival Netscape cease and desist publishing a "deceptive" pricing comparison chart on its Web site. The chart presents Windows NT Workstation as a legitimate platform for Netscape's Web server software.

Netscape not only did not remove the chart, but defiantly updated it to reflect Microsoft's new Windows NT Workstation 4.0 product. This was despite the fact that the Version 4.0 licensing agreement explicitly prohibits use of the operating system as a Web server platform.

"We do not intend to take the pricing chart down. In fact, we've enhanced it," a Netscape spokeswoman said.

Netscape contends that its server software works just fine on Windows NT Workstation and customers should not have to pay hundreds of dollars more to run it on NT Server 4.0. The Mountain View, Calif., software maker has complained to the U.S. Justice Department that Microsoft is violating antitrust laws by limiting customer choice with its "artificial" restrictions on the product's functionality.

Microsoft maintains that NT Workstation was never intended for server use and performance will suffer on that platform.

But Microsoft apparently will not be filing any lawsuits in the immediate future. The company said it views this as "an education issue, not a legal one at this time."

— *Carol Sliwa*

Subscribe

Continued from page 9

much more varies.

The main benefit of a subscription plan is that the customer does not have to pay for more frequent software upgrades, said Ben Cantlon, sales manager for Allaire Corp., a Minneapolis software vendor that will offer a subscription plan when it releases Version 2.0 of its ColdFusion Web development tool set this fall. Customers can budget software spending as an annual cost for planning purposes and are assured of always having the latest version, he said.

Subscriptions are much like software maintenance contracts, which have been around for years and often include telephone or technical support, according to Mary Welch, research director for software asset management at Gartner Group, Inc., a Stamford, Conn., market research firm.

The chief difference between subscription and maintenance plans is simplicity. "Maintenance contracts tend to be very complicated, with point systems and multiple categories and so on," said Dave Rothschild, director of marketing for client applications at Netscape Communications Corp. in Menlo Park, Calif.

By contrast, he said, users can click on a button in the Netscape Navigator Web browser to see the complete details of Netscape's subscription plan. "We tried to make a pretty clean, simple [subscription] program," he said.

Netscape is promoting a limited-time offer of its Netscape Gold browser by discounting the price of the product and subscription from $96 to $79. The price is good until Sept. 30 and is only slightly more than the $69 Netscape charges for its lower-end Netscape Navigator software.

SunSoft, Inc. of Menlo Park, Calif., will soon unveil a subscription plan for an array of Internet and development products.

A key part of the program is creating an internal framework of policies, procedures and technologies to make sure subscribers get what they are paying for, said Michael Bellissimo, SunSoft's director of software services. ■

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Reading the fine print in software subscription plans

1. **Look at the bottom line.** Compare the cost of buying a standard software maintenance contract with the subscription's cost.
2. **Look at the terms.** Exactly what is and is not included in the subscription?
3. **Look at the vendor's upgrade history.** How often are new features and versions introduced? How significant are the changes? Is the pace of change speeding up?
4. **Look at the vendor's delivery capability.** How is your subscription actually delivered? What systems exist to keep track of your information, to notify you of new releases, and to distribute physically the releases?
5. **Look at your own deployment capabilities.** Are your software distribution, installation, training and troubleshooting practices capable of supporting the faster pace typical of subscription programs?

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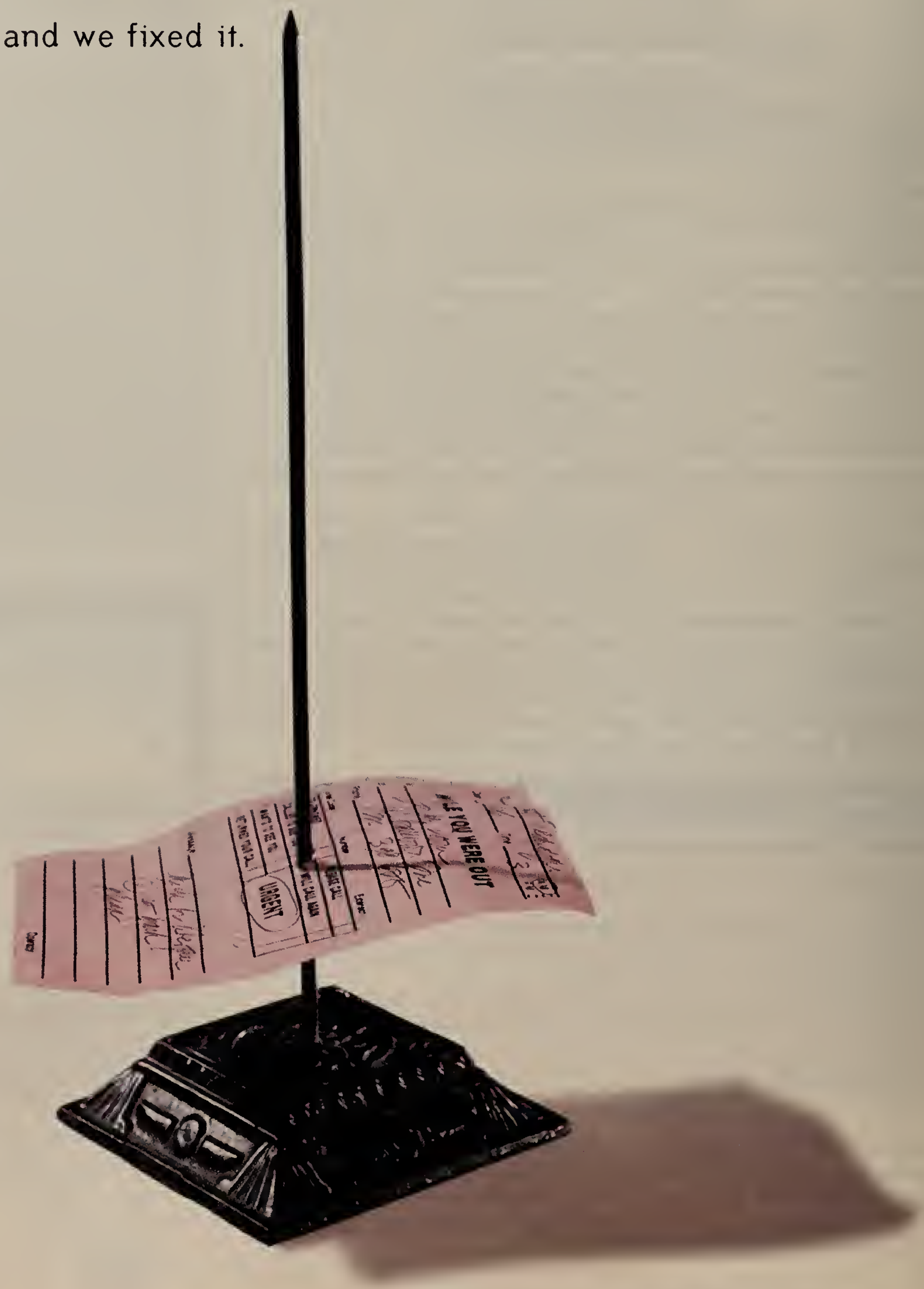

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Briefs

Ganymede Software, Inc. *last week introduced a Windows NT-based console package for its Chariot* **network performance testing** *tool. Chariot can now measure the performance of any SNA or TCP/IP environment from an OS/2 or Windows NT server. Windows NT console prices start at $9,000 for 10 users.*

Ganymede: (919) 558-1138.

DataRace, Inc. *will announce at Networld+Interop next month the Mach BRouter, a* **bridge/router module** *for the Mach DS plus line of multiplexers that allows connection of Ethernet LANs over the wide area at speeds from 56K bit/sec to 1.5M bit/sec. The company will also introduce NetEscort multiplexers with routing capabilities for branch-office wide-area voice, fax and LAN traffic at speeds up to 128K bit/sec. Mach BRouter lists for $1,895 and NetEscort for $4,895. Both will be available in the fourth quarter.*

DataRace: (210) 263-2075.

NETWORLD+INTEROP '96 10th ANNIVERSARY

Bay Networks, Inc. *has unveiled a* **channelized T-1 module** *for its Backbone Node routers that enables the device to function as a high-density central office frame relay access device. The two-port module is designed to link remote offices to corporate nets over frame relay.*

The module costs $20,000 and will be available in the fourth quarter.

Bay: (508) 670-8888.

Shiva Corp. *last week announced Shiva Dial-out for* **Windows 95,** *which allows remote PC users to dial out to remote LANs or servers through a Shiva LanRover or LanRover Access Switch. It requires ShivOS 4.02, which costs $275 to $499, depending on the user's current version.*

Shiva: (617) 270-8300.

Sterling targets MVS TCP/IP users

MVS mainframe line to be given new management role with release of Solve:NetMaster.

By Michael Cooney

Reston, Va.

Conventional wisdom says administrators cannot manage TCP/IP networks from an IBM mainframe environment.

Sterling Software, Inc. hopes to change that impression with a new version of its mainframe-based Solve:NetMaster network management software.

The company last week rolled out Solve:NetMaster for TCP/IP, an MVS mainframe software package designed to help users more efficiently manage and control TCP/IP nets linked to Big Iron.

"Tracking what's going on in the TCP/IP net is still pretty much a nightmare for most TCP/IP for MVS users."

Tracy Hulver, product manager for Sterling's Operations Management Division

Solve is Sterling's suite of software tools for the mainframe-based NetView and workstation-based management platforms such as Hewlett-Packard Co.'s OpenView. Solve:NetMaster is the flagship package in the Solve line and has, until now, focused mainly on managing SNA nets. While it had some limited TCP/IP management capabilities, the new software contains support for automation and other features that make it more viable for large-scale TCP/IP net management, executives claim.

IBM does offer some management tools for its TCP/IP for MVS environment, and its NetView/390 network management package can gather data on TCP/IP nets, but it is still pretty primitive, claimed Tracy Hulver, product manager for Sterling's Operations Management Division.

"What we are driving at is getting TCP/IP users the same level of management capability and network reliability that SNA users enjoy," said Steve Lafferty, product director at Sterling.

Solve:NetMaster for TCP/IP resides on the mainframe and monitors traffic flowing through IBM's TCP/IP for MVS package and VTAM — the software that controls communications with the mainframe.

It monitors tn3270 or telnet sessions and file transfer activity, and lets NetMaster operators monitor error conditions, detect hardware failures and isolate problems. For example, users can ping downstream devices such as routers to see of they are active or telnet to them to visually monitor their activity, Hulver said. Restart or other commands can then be directed at the device if there is a problem.

Users can log and store important events such as starts and stops of telnet or File Transfer Protocol sessions, data transmission performance and other systems activity, Lafferty said.

The software includes SNMP support, which lets operators gather and use the information captured by that management protocol.

The new release can also work with Sterling's other Solve tools. For example, SNA data gathered by Solve:NetMaster for SNA can be correlated with the TCP/IP data on one screen, Hulver said.

All of the Solve packages can present enterprise resource data on a NetView or NetMaster screen.

Sterling has for years fought a largely losing battle to dislodge IBM's NetView from IBM mainframe shops.

At best, it has carved a niche in the NetView market, but NetMaster has never seen the success NetView has. Analysts, however, believe Sterling could get a little bigger piece of the management pie with this new software package.

"Products that can efficiently manage TCP/IP and SNA are what's needed in the user community, and Sterling has an opportunity here to fill a big need," said John Webster, a senior research analyst with The Yankee Group consultancy in Boston.

Solve:NetMaster for TCP/IP is available for prices ranging from $9,000 to $130,000, depending on the size of the mainframe.

©Sterling: (800) 247-5163.

THE STERLING FILE

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Products:	Over 150 products ranging from E-mail to network management applications
Users:	Roughly 40,000 globally
1995 revenues:	$588 million
Divisions:	Applications Management, Systems Management, Federal Systems and International
Employees:	Over 3,600 in 60 countries

Vendors pop wares for bigger, faster networks

By Jim Duffy

Three network probe and analysis vendors last week announced new products and initiatives to broaden the scope of their respective offerings. Among the announcements:

- Hewlett-Packard Co. unveiled two LAN probes that feature support for multiple Ethernet segments and token ring.
- Concord Communications Corp. rolled out an application for reporting on the performance of routers and switches in a network.
- Network General Corp. disclosed plans to go beyond network fault and performance management and into the realm of systems management.

The three separate initiatives all indicate a common denominator: Users and emerging markets are increasingly demanding more than point products from vendors, prompting those vendors to branch out from traditional market niches.

HP, for example, found it necessary to roll out two probes to handle the increasing network traffic loads that switches produce and the service level guarantees that users demand.

HP's 3457A Quad Ethernet LanProbe is actually four Remote Monitoring (RMON) probes in one. It features four monitoring ports, one of which can be configured as a telemetry port for restricting management data to a dedicated LAN.

Each port features an RJ-45 or Ethernet attachment unit interface connection that can monitor packets at full Ethernet line rates.

The HP 4985B Token-Ring LanProbe is designed to handle increasing token-ring packet rates. It can monitor up to 30,000 packet/sec and allows managers to expand the level of events they track by looking at the number of hosts accessing the Internet.

This enables the 4985B Token-Ring LanProbe to record up to 64,000 hosts, a tenfold increase over previous HP token-ring probes.

The HP J3457A Quad Ethernet LanProbe costs $5,995 and will be available in October. The HP 4985B costs $3,035 and will be available in September.

Whereas HP probes collect data, Concord's new Network Health Router/Switch application analyzes and reports it. Network Health Router/Switch collects data from the Management Information Bases (MIB) of Bay Networks, Inc. and Cisco Systems, Inc. routers, and Bay and Cabletron Systems, Inc. switches, analyzes network behavior based on this data and generates reports showing performance trends and anomalies.

See **Net mgmt.,** *page 19*

New in collection and analysis...

...from Hewlett-Packard
- HP J3457A Quad Ethernet LanProbe
- HP 4985B Token-Ring LanProbe

...from Concord
- Network Health Router/Switch application

...from Network General
- Total Network Visibility fault and performance management architecture

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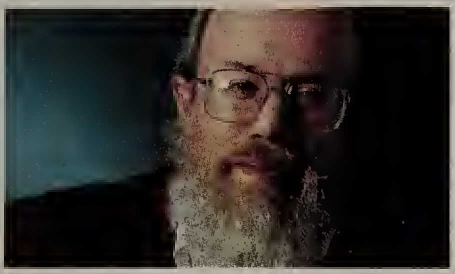
Circle Reader Service #28

INTERNETWORKING MONITOR

Selling virtual spaghetti

The other day, I happened across Charles Feltman's article "A Reality Check on Virtual LANs" in the July issue of *Business Communications Review.* It is quite a good article, but I think Charles missed one issue that makes the future usefulness of VLANs hard to predict.

The article explores some of the reasons why the VLAN concept is seen as useful and some of the reasons why the concept does not seem to have taken off.



Scott Bradner

For the jargon-deprived, in this context I'm considering a LAN to be the equivalent of an IP subnet or an AppleTalk or Novell network. That is, the network or pieces of the network connected by bridges or switches over which a packet sent to the broadcast address will be forwarded.

LANs are defined by the physical topology of where the network wires run. A VLAN is a LAN that is not constrained by the pattern of physical wires. VLANs are implemented by connecting the network wires together with switches that can logically group nodes together even if they are on separate wires.

The primary advantage cited for VLANs is the ability to deal with physical and logical personnel movement without recabling the networks. For example, Fred moves down the hall to an office with a window (in lieu of a raise), but Fred should still be considered part of the same group networkwise. It is claimed that this ability to deal with moves, adds and changes with far less effort could significantly reduce networking support costs in some of today's companies with all-too-active org charts.

Why might it be important to continue to have Fred be part of the same network group? There could be a number of reasons, from separation of users for security reasons, to not wanting to have to go reconfigure the IP address in Fred's PC. But the most common reason cited is to keep the users of a server grouped together so their traffic is isolated from the rest of the network.

The use of Dynamic Host Configuration Protocol can, with reasonable ease, eliminate the requirement to reconfigure individual machines. I'm not so sure that it is easy to group users into security-related groupings, so that leaves the user's affinity to a particular server as the major rational for VLANs.

But what about the trend toward centralized servers in many corporations — centralized in two senses of the word, putting the servers in a central location and putting more server functions on the same platform? I don't see the advantages of VLANs over physical LANs if one cannot logically associate groups of users with individual servers. If most users employ the same servers, then the division of the users into groups will not have the desired effect of separating the network traffic to reduce the network load.

It seems to me that selling virtual spaghetti (which is what VLANs are) is going to get harder as time goes on if the trend of concentrating points of failure continues.

An unrelated observation about the TV coverage of the recent Olympic games: It sure would be better if NBC paid their commentators by the hour instead of by the word.

Disclaimer: You can't use centralize and Harvard in the same sentence, so the above must be my ideas.

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.

Net mgmt.

Continued from page 16

Reports from Network Health Router/Switch show CPU performance, buffer management, network load through the internetworking devices, and problem areas against baseline criteria on a daily or weekly basis.

From these reports, network managers can identify trends to plan for network expansion or anticipate upcoming problems.

Network Health Router/Switch costs $6,000. It will be available next month.

Reporting on network health is but one piece of Network General's new mission to provide end-to-end fault and performance management throughout the network.

The company's Total Network Visibility strategy encompasses a whole lot more.

Total Network Visibility (TNV) is an architectural framework for managing systems, networks, applications and databases using various multivendor data sources, distributed event correlation and modeling servers, and applications with Windows, Web and Unix interfaces.

Though TNV sounds and looks like the frameworks management platform vendors have been talking about for years now, it is a more flexible approach in that TNV can serve as a platform or an application, said Sydney Fisher, senior product manager for Network General.

The first TNV product will emerge next month for network health and quality of service management.

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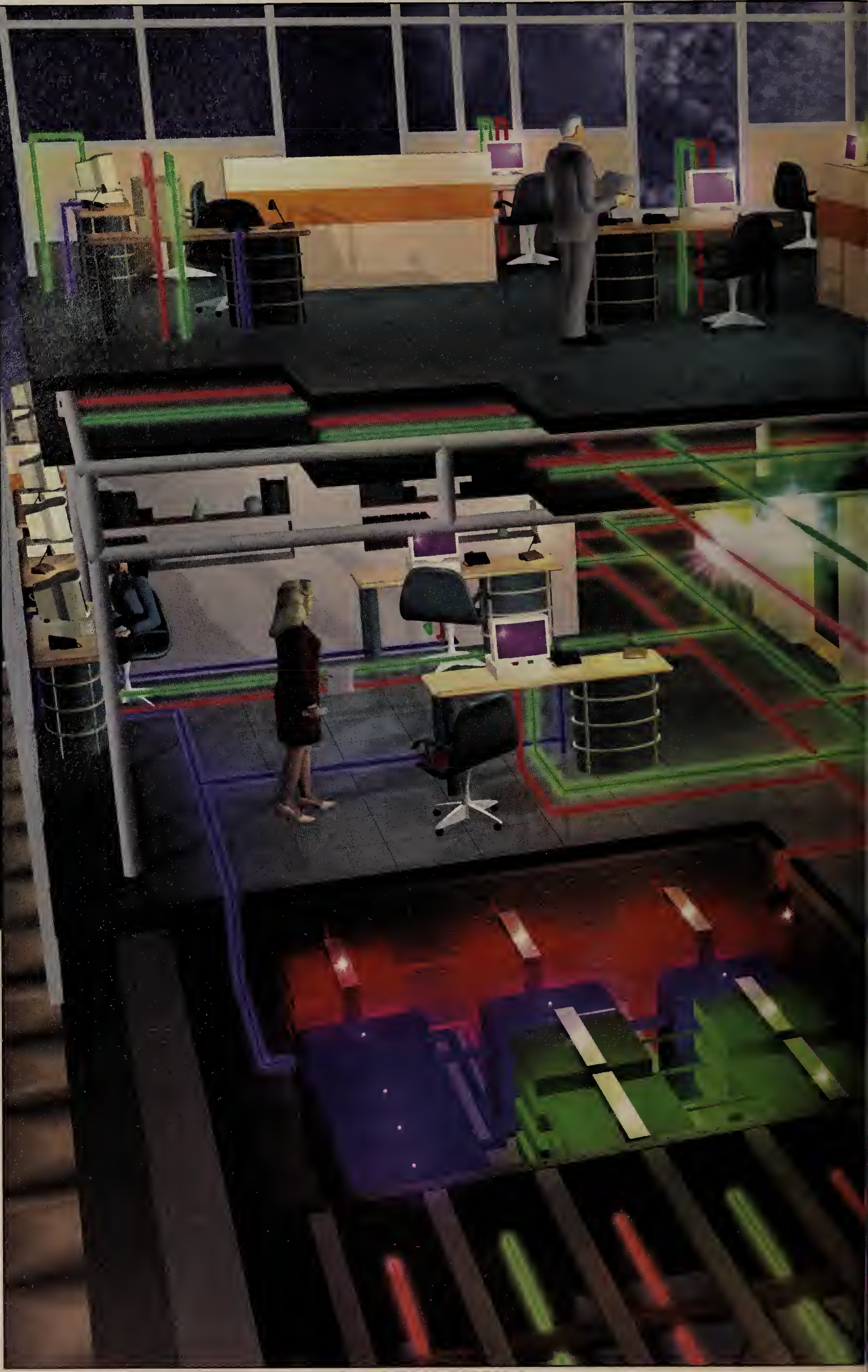

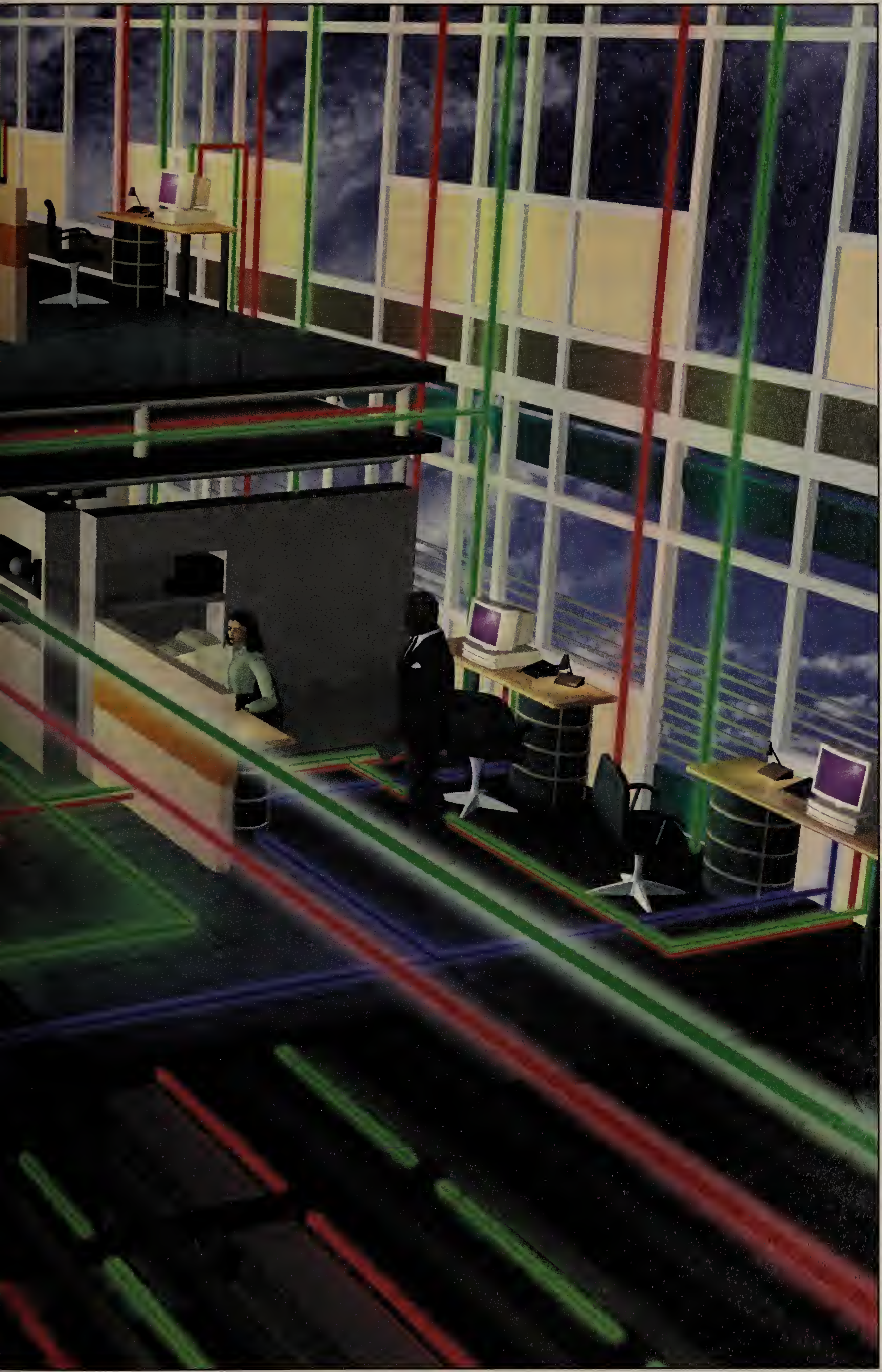

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Circle Reader Service # **26**

Covering: Local and Long-Distance Services • Value-Added Networks • Cable, Satellite and Wireless Networks • Regulatory Affairs • Carrier-Based Internet Services

Briefs

The **Federal Communications Commission** *has devised a rule to help users who get attractive offers for intra-LATA toll calls from a different carrier than their primary interexchange carrier. The FCC ordered local exchange carriers (LEC) to implement* **Two-PIC toll dialing parity,** *under which users could, for example, have all their inter-local access and transport area calls automatically switched to AT&T but have their intra-LATA toll calls go to MCI Communications Corp. Without the Two-PIC rule, users would have to instruct employees to dial extra digits. But don't hold your breath waiting for Two-PIC dialing: The FCC gave the LECs until Feb. 8, 1999, to implement it.*

FCC Chairman Reed Hundt *would be practically* **tied to his office** *under a provision slipped into a bill introduced by Rep. Jack Fields (R-Tex.) and Rep. John Dingell (D-Mich.). The provision would bar the peripatetic Hundt from traveling more than 50 miles from FCC headquarters for the next two years.*

Hundt

SBC Communications *has reached an agreement with AT&T Wireless Properties to buy the* **cellular licenses** *and networks to provide cellular service in Arkansas. SBC also gets AT&T's 9.4% share of SBC's Worcester, Mass., cellular system. In return, AT&T gets an undisclosed amount of cash, SBC's PCS licenses for Little Rock, Ark., and Memphis, Tenn., and SBC's minority share of the PCS license for Pittsburgh.*

MFS Communications Co. *and* **UUNET Technologies, Inc.** *last week completed their $2 billion merger. The new company is expected to use the combined networks to offer users Internet and intranet quality of service guarantees.*

Telecom reform snarls government contract

Congress, GSA disagree on speed of telecom changes.

By David Rohde
Washington, D.C.

Disagreement and confusion over how fast telecom reform will roll out is threatening to delay the biggest long-distance contract in the country: the follow-on to Federal Telecommunications System (FTS) 2000 for federal government users.

Link to Network World Fusion for a copy of a General Services Administration report on FTS 2000. The report includes:
- **A price comparison with commercial tariffs**
- **A look at future federal telecommunications costs**

Select News+.

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http://www.nwfusion.com

Several prominent members of Congress have told the General Services Administration (GSA) to delay release of the draft request for proposals (RFP) for the so-called Post-FTS 2000 megacontract.

The legislators want it delayed until next spring because they believe that will give regional Bell operating companies enough time to enter the long-distance market and compete for Post-FTS 2000 business, said close observers of the federal telecom scene.

But such a delay could end up costing budget-strapped federal users both service enhancements and money, the observers warned. The new contract is due to include services not available under the original FTS 2000, such as cellular, satellite and messaging services.

The original FTS 2000 contract, awarded jointly to AT&T and Sprint Corp. in 1988 and now worth more than $600 million a year, expires on Dec. 7, 1998.

The GSA wanted to issue the draft RFP for the new contract this month, effectively limiting the competition for the expected new 10-year term to existing long-distance carriers. But a new bill backed by Sen. Richard Shelby (R-Ala.) and Sen. Bob Kerrey (D-Neb.) would force the GSA to issue the draft RFP no earlier than May 1997.

Waiting until then does not leave enough time to receive proposals, evaluate them, award the contract, fight off the inevitable protests, and work with the winners to provision the services, said Warren Suss, president of Warren H. Suss Associates, a Jenkintown, Pa., consultancy specializing in federal contracts. "The fixed costs of putting in these networks are enormous," Suss added.

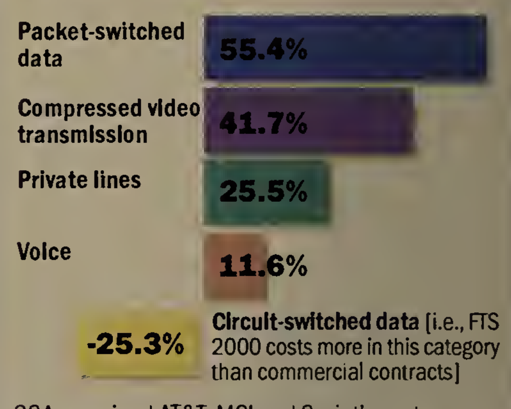
FTS Commissioner Bob Woods has said the new contract could include an "open season" for new long-distance competitors, but only sometime after the contract begins. "There is a question about whether the RBOCs will be credible competitors for a contract like this in the next three years," Suss said.

By aggregating such an enormous amount of business, the FTS 2000 contract already saves federal agencies a fair piece of change, but the amount of the savings varies by service (see graphic).

Even on private line services, where overall rates are more than 25% below the best available commercial contract, the benefits are skewed toward the analog circuits widely installed in the late 1980s. FTS 2000 users save 43% below commercial rates on 9.6K bit/sec analog circuits, but 15.2% on 56K bit/sec digital circuits and 17% on T-1 lines. ■

Government's their best customer

How much the GSA calculates federal agencies save using FTS 2000 vs. the best available commercial carrier contracts:



GSA examined AT&T, MCI and Sprint's custom contract tariffs as well as regular tariffs to determine the lowest commercial price.

SOURCE: GENERAL SERVICES ADMINISTRATION, WASHINGTON, D.C.

Mexican carrier yokes service offerings to MCI's

By David Rohde
Mexico City

MCI Communications Corp. last week became the first long-distance carrier to complete what ostensibly can be called a seamless North American network for voice and data services.

The company's Mexican partner Avantel, a principal competitor to dominant carrier Telefonos de Mexico (Telmex), last Monday opened its 3,382-mile domestic fiber network for business and launched a new switched long-distance service.

The move came a day after a new law took effect in Mexico allowing Telmex competitors to offer services over their own networks. With the opening of the Avantel network, MCI now can extend its voice and data services into both Canada and Mexico.

MCI earlier cemented a similar relationship with the Stentor group of Canadian carriers, including Bell Canada. The ability to extend its HyperStream frame relay service into Canada has been a key factor in winning cross-border contracts such as a frame relay deal with General Electric Corp. (*NW,* Feb. 27, 1995, page 41).

Avantel is 45% owned by MCI; the other 55% is held by the Mexican banking concern Grupo Financiero Banamex-Accival. Since the beginning of the year, Avantel has been introducing a series of domestic services, starting with private lines and packet data services (see graphic). But until last week, the only way it could legally provide transport for these services was over E-1 (2.048M bit/sec) dedicated circuits leased from Telmex, explained Richard Perez, an MCI senior engineer on assignment to Avantel.

To provide full-feature transparency among the two carriers' services, Avantel has been building its platforms virtually identical to MCI's. Both MCI's Vnet and Avantel's Vision de Avantel virtual private networks are provisioned over Northern Telecom, Inc. DMS-250 central office switches. And both carriers' frame relay services run over Bay Networks, Inc. Backbone Concentration Node Model 77012 switches. Two border-crossing points between the Avantel and MCI backbones are provided near McAllen and El Paso, Texas.

Telmex's official U.S. partner is Sprint Corp. Those two carriers announced last December that they would work together to introduce seamless cross-border services.

But Sprint officials last week were unable to point to any fruits of that relationship so far. ■

A busy partner

Products introduced by MCI's partner Avantel in Mexico so far in 1996:

Feb. 13
Avantel Linea Plus
Private line service

Avantel Net X.25 Packet
X.25 packet network service

Avantel Frame Relay
Frame relay service linked with MCI's HyperStream*

March 25
InternetMCI de Avantel
Dedicated access service to the Internet

April 20
Avantel MultiFax
Public fax service

June 24
Vision de Avantel
Virtual private network linked with MCI's Vision and Vnet*

Aug. 12
Avantel Larga Distancia
Ordinary toll service over alternative network

* Prior to Aug. 12, interconnection with U.S. services available only via dedicated circuits leased through Telmex.

SOURCE: MCI, WASHINGTON, D.C.

ISDN competition gets hit in Calif. as PacBell withdraws proposal

By Tim Greene
San Francisco

Competition in the local ISDN market suffered a blow recently when the California Public Utilities Commission (PUC) shot down a proposal that would have pushed Pacific Bell to sell ISDN to other carriers at wholesale prices.

The resale arrangement was one sweetener in a negotiated plan designed to blunt a proposed Pacific Bell rate increase for ISDN in California, a bellwether state for ISDN prices.

But Intel Corp. and other parties that have been fighting Pacific Bell's initial ISDN rate-hike filing insisted that the California PUC hold full hearings rather than accept the compromise.

The agreement, worked out among Pacific Bell, the California ISDN Users Group (CIUG) and others, was informal and lasted about a day until it was withdrawn when it became apparent it would not sail through unchallenged.

In that withdrawn proposal, Pacific Bell would have boosted the monthly Basic Rate Interface ISDN fee by $5 and thrown in 200 free hours per month of connect time outside weekdays between 8 a.m. and 5 p.m.

One of the conditions was that Pacific Bell would actively promote resale of ISDN by competitors.

According to Robert Larribeau, the director of the CIUG, that would have done a lot to improve ISDN service quality in the state, one of the CIUG's major beefs with Pacific Bell.

Larribeau said he had hoped the deal would spark competition from major long-distance carriers reselling ISDN. Although offering alternative pricing to Pacific Bell, he said he thought it would also prompt better service quality from the carrier. Even though competitors would simply be rebranding Pacific Bell service, they would have the clout to insist on a certain level of quality.

PacBell ISDN-rate rollercoaster

Pacific Bell has returned to a steeper rate-hike proposal

	Monthly	Free time
Now	$24.50	Off peak*
Dead proposal	$29.50	200 hours off peak
New proposal	$32.50	20 hours off peak

(Usage rates are the same, ranging from 0.5-3 cents/min depending on time of day. Installation is constant at $125. A free installation waiver has been rescinded.)

*Peak hours are weekdays, 8 a.m. to 5 p.m.

SOURCE: PACIFIC BELL, SAN FRANCISCO

"Large carriers have very good channels of communication with Pacific Bell. They know whose cage to rattle when they have a problem," Larribeau said.

In pulling back its proposal, Pacific Bell said it would rather go to the California PUC with its original, harder-line proposal than to start PUC consideration at the negotiated level. ■

Internet services

Cable & Wireless to stretch small ISP networks, helping to avoid big shakeout

By Joanie Wexler
Vienna, Va.

Some local and regional Internet service providers could survive — or at least postpone — the mass shakeout said to be nearly upon them by teaming with worldwide telecommunications carriers.

Some are already trying this approach. A recent deal involves Cable & Wireless Internet Exchange (CWIX) and Erol's Internet & Computers, a year-old, 50,000-member ISP in Springfield, Va. CWIX is a business unit of Cable & Wireless, Inc., a partnership of companies offering telecommunications services in approximately 40 countries.

The initial plan is to build a nationwide network for Erol's, which will be first rolled out in nine East Coast cities and Chicago. That part of the project will be completed by year-end.

Such deals allow downstream ISPs such as Erol's to link to established global networks — run by companies they do not compete with — to provide service that stretches around the globe.

The hookups also heighten network reliability because the traffic stays mostly on the global partner's managed network.

In fact, "CWIX's performance goal is for traffic to make no more than two router hops between two locations," said George Vinall, CWIX general manager. He likened the philosophy with that of people who partake of air travel: The fewer connections you have to make, the less possibility for screw-ups.

CWIX provides frame relay connections from an Erol's customer site to Erol's data center, which houses Erol's "backbone" — a LAN internetwork. From the data center, CWIX provides a dedicated link to a network exchange point that CWIX operates and dedicated links to Cable & Wireless point of presence in other cities.

If the traffic is destined for somewhere Cable & Wireless has no POP, it is handed off to another ISP's network. ■

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If fast, reliable communications links and dedicated customer service sound appealing, call the company Chiquita picked out of the bunch. To learn more, call Swiss Telecom North America at 1-800-966-1145.

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1 Industry: (check one only)

01. ☐ Manufacturers (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
12. ☐ Government (Federal/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consultants (Independent)
16. ☐ Carriers/Interconnects
17. ☐ Manufacturers (Computer/Communications)
18. ☐ Resellers of Computer/Network Products (VARs, VADs)
19. ☐ Systems/Network Integrators
20. ☐ Distributors (Computer/Communications)
21. ☐ Other *(please specify)* ______________

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:

1. ☐ Networking Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS, IT, MIS, Systems Management
5. ☐ Engineering Management
6. ☐ Corporate Management (CIO, CEO, Pres., VP, Dir., Mgr., Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other *(please specify)* ______________

3 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1
7. ☐ None

4 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)
1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. INVOLVEMENT (check all that apply)
1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ None

5 Check ALL that apply in Columns A and B:

A. I am involved in the purchase of the following products/services:
B. I plan to purchase the following products/services:

A B
☐ 100 ☐ **LOCAL-AREA NETWORKS**
☐ 01. ☐ Local-Area Networks
☐ 02. ☐ Network Op. Sys. Software
☐ 03. ☐ LAN Storage/Backup
☐ 04. ☐ Optical LAN Storage/Backup
☐ 05. ☐ Disk LAN Storage/Backup
☐ 06. ☐ Tape LAN Storage/Backup
☐ 07. ☐ RAID LAN Storage/Backup
☐ 08. ☐ Network Test/Diagnostic Tools
☐ 09. ☐ Cables, Connectors, Baluns
☐ 10. ☐ UPS
☐ 11. ☐ Network Interface Cards
☐ 12. ☐ Peer-to-Peer LANs
☐ 13. ☐ SNMP Network Management
☐ 14. ☐ ATM Switches
☐ 15. ☐ Token-Ring Switches
☐ 16. ☐ Ethernet Switches
☐ 17. ☐ Remote LAN Access/Communications Servers
☐ 18. ☐ Superservers
☐ 19. ☐ File/Application Servers
☐ 20. ☐ Print Servers/Fax Servers
☐ 21. ☐ CD-ROM Servers
☐ 22. ☐ LAN Servers

A B
☐ 101 ☐ **INTERNETWORKING**
☐ 23. ☐ Bridges
☐ 24. ☐ Routers
☐ 25. ☐ Bridge/Router
☐ 26. ☐ Gateways
☐ 27. ☐ Intelligent Hubs
☐ 28. ☐ Stackable Hubs

A B
☐ 102 ☐ **COMPUTERS/PERIPHERALS**
☐ 29. ☐ Laptops/Notebooks/Sub-Notebooks
☐ 30. ☐ Micros/PCs
☐ 31. ☐ Minis
☐ 32. ☐ Mainframes
☐ 33. ☐ Workstations
☐ 34. ☐ Terminals
☐ 35. ☐ Printers/Network Printers
☐ 36. ☐ Cluster Controllers
☐ 37. ☐ CD-ROM
☐ 38. ☐ Fax/Modem Boards

A B
☐ 103 ☐ **REMOTE/WIRELESS COMPUTING**
☐ 39. ☐ PDAs
☐ 40. ☐ PCMCIA Devices
☐ 41. ☐ Wireless Data Services
☐ 42. ☐ Wireless Data Equipment
☐ 43. ☐ Wireless LANs
☐ 44. ☐ Cellular Equipment & Services

A B
☐ 104 ☐ **INTERNET/INTRANET**
☐ 45. ☐ Internet Access Service
☐ 46. ☐ Firewalls/Security
☐ 47. ☐ Web Servers
☐ 48. ☐ Web Browsers
☐ 49. ☐ Intranet Applications/Groupware
☐ 50. ☐ Search Retrieval Products (web crawler)
☐ 51. ☐ Internet Development Tools
☐ 52. ☐ Internet Commerce Tools

A B
☐ 105 ☐ **SOFTWARE/APPLICATIONS**
☐ 53. ☐ Network Management
☐ 54. ☐ Systems Management
☐ 55. ☐ Security
☐ 56. ☐ Communications Software
☐ 57. ☐ Terminal Emulation
☐ 58. ☐ Word Processing
☐ 59. ☐ Operating Systems
☐ 60. ☐ Client/Server Applications Development
☐ 61. ☐ Database Management/RDBMS
☐ 62. ☐ Spreadsheet
☐ 63. ☐ Groupware
☐ 64. ☐ EDI
☐ 65. ☐ E-mail
☐ 66. ☐ Windows/Graphical User Interface
☐ 67. ☐ Multimedia
☐ 68. ☐ Graphics/DTP
☐ 69. ☐ Remote Access
☐ 70. ☐ Imaging
☐ 71. ☐ Server Suites (Backoffice, etc.)
☐ 72. ☐ Suites
☐ 73. ☐ Middleware
☐ 74. ☐ Document Management
☐ 75. ☐ Database Server
☐ 76. ☐ Site Metering Tools
☐ 77. ☐ Computer-Integrated Telephony (CIT)

A B
☐ 106 ☐ **WIDE-AREA NETWORK EQUIPMENT & SERVICES**
☐ 78. ☐ Frame Relay Equip./Services
☐ 79. ☐ Modems
☐ 80. ☐ FT-1/T-1/T-3 Multiplexers
☐ 81. ☐ FT-1/T-1/T-3 Services
☐ 82. ☐ SONET
☐ 83. ☐ Inverse Multiplexers
☐ 84. ☐ SMDS
☐ 85. ☐ Asynchronous Transfer Mode
☐ 86. ☐ Diagnostic/Test Equipment
☐ 87. ☐ DSU/CSU
☐ 88. ☐ VSAT/Satellite
☐ 89. ☐ ISDN Equipment & Services
☐ 90. ☐ PBXs
☐ 91. ☐ Voice Mail/Response
☐ 92. ☐ Videoconferencing
☐ 93. ☐ Leased Lines
☐ 94. ☐ Switched Data
☐ 95. ☐ E-mail
☐ 96. ☐ 800/900/MTS Services
☐ 97. ☐ Virtual Networks
☐ 98. ☐ Outsourcing/Systems Integration Services
☐ 99. ☐ Education/Training Services

☐ 107 ☐ None of the above (1-99)

B10896

6 What is the total number of LANs, workstations/nodes at this location/ in your organization?

At this location:

	LANs		Workstations/ Nodes
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	1 - 9	☐

Entire organization:

	LANs		Workstations/ Nodes
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	1 - 9	☐

7 Check ALL that apply in Columns A and B:

A. The following network platforms are currently installed:
B. The following network platforms are planned for purchase:

A B
☐ 55 ☐ **NETWORK PROTOCOLS**
☐ 01. ☐ SNA
☐ 02. ☐ DECnet
☐ 03. ☐ TCP/IP
☐ 04. ☐ Novell IPX/SPX
☐ 05. ☐ APPC/APPN/LU 6.2
☐ 06. ☐ NETBIOS
☐ 07. ☐ AppleTalk
☐ 08. ☐ NFS
☐ 09. ☐ IPv6
☐ 10. ☐ SNMP/SNMPv2
☐ 11. ☐ Other *(please specify)* ______________

A B
☐ 56 ☐ **NETWORK OPERATING SYSTEM**
☐ 12. ☐ Microsoft (LAN Manager)
☐ 13. ☐ Novell (NetWare 2.X, 3.X)
☐ 14. ☐ Novell (NetWare 4.X)
☐ 15. ☐ Windows NT
☐ 16. ☐ Windows NT/Advanced Server
☐ 17. ☐ LocalTalk (AppleTalk)
☐ 18. ☐ Banyan (VINES)
☐ 19. ☐ IBM (LAN Server)
☐ 20. ☐ IBM (PC LAN Program)
☐ 21. ☐ Artisoft (LANtastic)
☐ 22. ☐ Digital (Pathworks)
☐ 23. ☐ Other *(please specify)* ______________

A B
☐ 57 ☐ **LAN ENVIRONMENT**
☐ 24. ☐ 4M Token Ring
☐ 25. ☐ 16M Token Ring
☐ 26. ☐ Ethernet
☐ 27. ☐ Fast Ethernet
☐ 28. ☐ 100vg Any LAN
☐ 29. ☐ FDDI
☐ 30. ☐ LocalTalk
☐ 31. ☐ 10Base-T
☐ 32. ☐ ATM
☐ 33. ☐ Other *(please specify)* ______________

A B
☐ 58 ☐ **COMPUTER OPERATING SYSTEM**
☐ 34. ☐ DOS
☐ 35. ☐ Unix/Xenix/AIX
☐ 36. ☐ OS/2
☐ 37. ☐ OS/2 Warp
☐ 38. ☐ IBM MVS
☐ 39. ☐ IBM VM
☐ 40. ☐ Digital VMS
☐ 41. ☐ Macintosh
☐ 42. ☐ Windows
☐ 43. ☐ Windows 95
☐ 44. ☐ NT
☐ 45. ☐ Solaris
☐ 46. ☐ Other *(please specify)* ______________

☐ 47. ☐ None of the above (1-46)

8 For which areas outside of North America do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

9 Please indicate your involvement in developing/implementing Internet/ Intranet Technologies: (check all that apply)

1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ Implement
6. ☐ None

10 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

	Mainframes A – Installed	Mainframes B – Planned
1. IBM	☐	☐
2. Amdahl	☐	☐
3. Cray	☐	☐
4. Hitachi	☐	☐
5. Unisys	☐	☐

	Minis C – Installed	Minis D – Planned
1. IBM	☐	☐
2. Digital	☐	☐
3. Tandem	☐	☐
4. Unisys	☐	☐
5. AT&T GIS	☐	☐
6. HP	☐	☐
7. Data General	☐	☐

What is the total number of Servers/Clients installed/planned: (USE NUMBERS ONLY)

E-AT THIS LOCATION	#	F-% with Internet Access
1. Servers		%
2. Clients		%

G-ENTIRE ORGANIZATION	#	H-% with Internet Access
1. Servers		%
2. Clients		%

Which of the following Servers/Clients do you have installed/planned: (CHECK ALL THAT APPLY)

	At this location: I. Servers	At this location: J. Clients	Entire organization: K. Servers	Entire organization: L. Clients
01. Power PC	☐	☐	☐	☐
02. Power Mac	☐	☐	☐	☐
03. Mac Other	☐	☐	☐	☐
04. Multi Processor Servers	☐	☐	☐	☐
05. P6	☐	☐	☐	☐
06. Pentium Pro	☐	☐	☐	☐
07. Pentium	☐	☐	☐	☐
08. 486	☐	☐	☐	☐
09. 386	☐	☐	☐	☐
10. 286	☐	☐	☐	☐
11. Risc	☐	☐	☐	☐
12. Other	☐	☐	☐	☐

11 What is the estimated value of networking equipment and services that you help specify, recommend or approve annually? (check one only)

01. ☐ $100 million or more
02. ☐ $50 million - $99.9 million
03. ☐ $25 million - $49.9 million
04. ☐ $20 million - $24.9 million
05. ☐ $10 million - $19.9 million
06. ☐ $5 million - $9.9 million
07. ☐ $1 million - $4.9 million
08. ☐ $500,000 - $999,999
09. ☐ $250,000 - $499,999
10. ☐ $249,999 or less
11. ☐ None of the above

12 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ $10 billion or more
2. ☐ $1 billion to $9.9 billion
3. ☐ $500 million to $999.9 million
4. ☐ $100 million to $499.9 million
5. ☐ $50 million to $99.9 million
6. ☐ $10 million to $49.9 million
7. ☐ $5 million to $9.9 million
8. ☐ $4.9 million or less
9. ☐ None of the above

13 Estimated number of employees at this location/in entire organization:

At this location:
1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

Entire organization:
1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

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Briefs

■ **Intel Corp.** *last week enhanced its line of* **PCI EtherExpress Pro/100 Fast Ethernet and Pro/10+ Ethernet adapters** *with a software update that reduces network collisions. The new feature — based on Intel's Adaptive Technology — enables the adapter to monitor net traffic and tune itself for optimal performance. Internal tests at Intel indicate that Fast Ethernet users may see as much as 5% throughput gain; Ethernet customers can expect to see as much as a 15% performance boost. Starting Sept. 30, customers can download the upgrade free via Intel's Web site (http://www.intel.com/comm-net/sns).*

Intel: (800) 538-3373.

■ **Novell, Inc.** *is offering customers the opportunity to buy NetWare 4.1 now and upgrade to the next release for free when it ships later this fall. The offer is good for those who buy NetWare 4.1 anytime between now and 30 days after NetWare 4.11 (formerly known as Green River) is released.*

The deadline for submitting applications for the **free upgrade** *will be 60 days after NetWare 4.11 begins shipping.*

Novell: (800) 638-9273.

■ **NCR Corp.** *last week announced a technology that allows customers to extend the life of their WorldMark servers by doubling the number of* **Pentium Pro** *processors from four to eight.*

The company's OctaScale controller — which allows the addition of a four-processor Pentium Pro board — is designed for symmetrical processing servers running transaction processing, printer server and other applications.

NCR: (513) 297-5700.

Analysis

Novell's CNE program gets spruced up

By Ron Nutter

If you are involved to any degree in networking, you will have heard of Novell's Certified Novell Engineer (CNE) program. What you may not be aware of are changes that were announced last summer and have been refined since then.

Novell, Inc. has taken criticism in the past for producing "paper CNEs," individuals who were good at taking tests but in some cases had no practical experience on the products they were certified on. Significant changes have been made to the program that should help companies looking for skilled, quality talent find what they need.

The CNE certification has been stratified into three platforms — CNE-NetWare 3, CNE-NetWare 4 and CNE-GroupWare. The first two specializa-

See **Novell,** *page 28*

Start-up seeks Acclaim in switch mart

Company rolls out Ethernet/Fast Ethernet switches with frame relay, ISDN connectivity.

By Jodi Cohen
Santa Clara, Calif.

Start-up Acclaim Communications, Inc. last week announced it will roll out Ethernet and Fast Ethernet switches with a WAN twist to help customers more easily access the Internet.

The company — founded by former officials from Fast Ethernet pioneer Kalpana, Inc. and frame relay provider StrataCom, Inc. — said its EtherWAN products will feature switched 10M and 100M bit/sec Ethernet interfaces as well as frame relay and ISDN links for WAN access.

Typically, customers have to buy separate network devices, such as a LAN hub or switch, a router and a DSU/CSU, to connect to an Internet service provider.

But Acclaim's approach simplifies things, an analyst said.

"This is a nice, easy way to drop a solution in that does LAN and WAN connectivity," said Don Miller, director and principal analyst at Dataquest, Inc., a market research firm in San Jose, Calif. "The interoperability issues among different net components disappear, costs could come down and management is made simpler."

The key to Acclaim's EtherWAN products — which will be demonstrated at next month's NetWorld+Interop '96 conference in Atlanta — is the company's Thriller Application Specific Integrated Circuit. Thriller integrates LAN and WAN technologies in silicon, eliminating the need for separate ASICs for each interface.

PROFILE: ACCLAIM COMMUNICATIONS

Headquarters: Santa Clara, Calif.
Funding: Private
Management team: Officials from Kalpana and StrataCom
Products: LAN/WAN switching and access devices

The Acclaim 1024-2ES offers 24 10M bit/sec switched Ethernet ports and two 100M bit/sec switched Ethernet high-speed uplinks as well as an optional WAN interface.

The device can be used as a workgroup access switch to provide dedicated Ethernet links to the desktop, Fast Ethernet connections to servers, and a frame relay or ISDN link to the WAN.

The company is also offering the Acclaim 2024-FES backbone switch, which provides 24 10M/100M bit/sec switched Ethernet ports, an optional Gigabit Ethernet uplink port and a WAN interface.

Customers can configure, view and manage networks based on the switches with Acclaim's WindowsView, a Windows-based SNMP platform.

Pricing for the 1024-2ES and the 2024-FES will start at $4,995 and $14,400, respectively. Both EtherWAN products will ship early in the fourth quarter.

Fusing FRADs and FRARs

In addition to the EtherWAN products, Acclaim rolled out a family of frame relay access device/routers (FRAD/FRAR).

Typically, FRADs have been stand-alone products that connect serial devices to corporate backbones or a public frame relay network via dedicated leased lines. FRARs have been stand-alone devices serving as routers. Acclaim's Series 3000 devices merge the two, simplifying frame relay access and management, industry observers said.

The 3000FR, which can be

See **Acclaim,** *page 28*

Download Fast Ethernet primers from Network World Fusion. Select News+.

NetworkWorld Fusion
http://www.nwfusion.com

Windows NT wins more third-party support

By Christine Burns
San Francisco

A host of third-party products will soon help make Microsoft Corp.'s Windows NT a better platform for accessing remote network resources, Web content and distributed applications.

Cubix Corp., Cognisoft Corp. and The Sapphire Group are among the companies prepared to demonstrate new Windows NT-based products at the Windows NT Intranet Solution Conference next week.

Cubix of Carson City, Nev., will make two additions to its WorldDesk line of remote access products.

The first is Comlink, client software that lets Windows NT users take advantage of the WorldDesk Commuter six-port remote access server. Commuter includes an automatic failover capability and clustering management software for stringing Commuter servers together.

Comlink provides further assurance that end users can access the net resources they need by reestablishing Windows NT sessions with WorldDesk Commuter servers if a session is interrupted or dropped because a link times out or a port connection fails.

According to Graham Holmes, senior product manager at Cubix, Comlink offers features beyond the remote client software built into Windows NT Workstation 4.0.

Although both Comlink and NT Workstation 4.0 will have automatic dial-up functions, Comlink has built-in security, dynamic modem pooling and load balancing of outbound sessions across all ports.

Cubix's second new product is called Applink, an NT-based middleware package that selects whether an application requested by a remote user should be downloaded from the network server to execute on the remote node or should run locally but be controlled remotely by the dial-in user. Applink lets administrators predefine rules for when applications run via remote control or on the remote node.

Applink beta tester Bill Botti, president of Pleasanton, Calif., reseller Computer Networks, said Applink simplifies remote access.

"Users get confused over which remote mode they should use when trying to get at different network services," according to Botti.

"If they choose the wrong one, they either sacrifice performance or functionality. Applink solves that issue without a hassle," he said.

See **NT,** *page 27*

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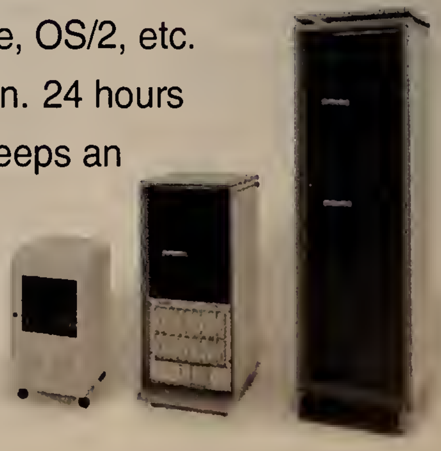

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Circle Reader Service **#32**

NET RESULTS

Watch for those ATM upgrade costs

ATM technology has reached a point where companies can use products based on it to build a campus LAN backbone network. But be warned that changes to the core ATM technology could force you to make significant upgrades — and even wholesale replacements.

Unlike past network technologies in which upgrades could be done in software, the high processing rates and bandwidth supported by ATM switches leave vendors with little choice but to build hardware-based products.

A software upgrade running on the system processor and in memory just cannot compare to an Application Specific Integrated Circuit-based upgrade.

Skip MacAskill and Melinda Le Baron

So expect firmware upgrades — including new modules, interface cards and daughterboards — to be the norm when it comes to ATM products. Some vendors will even suggest return-to-factory upgrades in which they will pull your whole switch.

Functions that will require these types of upgrades include the Private Network-to-Network Interface, available bit rate (ABR) traffic management features and Version 4.0 of the User Network Interface.

The architecture of each vendor's switch or network interface card will determine the type of upgrade necessary.

Take ABR upgrades, for example, which are slated for mid-1997 by most ATM vendors. Cisco Systems, Inc. will require a change of daughterboard cards for the Lightstream 10/10 to implement full ABR. Fore Systems, Inc., on the other hand, will require a change of module port cards for the ASX-200.

Although ABR may not be necessary in all networks, to have a completely standards-based implementation, new hardware will be necessary.

The challenge for a network manager is that firmware upgrades typically require significant network downtime. And this, of course, is the last thing you need as you try to juggle the integration of new high-speed LAN technology, figure out how all this will be managed and put out the network fires that consume most of your time.

To make the process as painless as possible, we suggest pinning vendors down on future upgrades. Then be aggressive about negotiating contractual clauses in the maintenance or purchasing contract for your ATM gear that cover the cost and downtime related to upgrades.

Fortunately, some vendors are trying to be proactive in this area, offering products that can easily be upgraded by customers themselves at deep discounts.

Expect vendors to be especially flexible about upgrade fees in the next 12 months or so, given that many of them are more interested now in seeding the market with their gear and grabbing market share.

Who knows, you might even be able to talk companies into promising free upgrades upon initial purchase of ATM products.

MacAskill is a senior research analyst and Le Baron is a research director in Gartner Group, Inc.'s Network Computing Infrastructure group. They can be reached at (203) 316-1111 or at inquiry@gartner.com.

NT

Continued from page 25

Applink supports many popular remote access servers such as Citrix Corp.'s WinFrame and Microsoft's NT Remote Access Services.

Separately, Cognisoft and Sapphire will introduce products addressing the delivery of intranet and Internet content.

Cognisoft, a Redmond, Wash., start-up formed in April, will demonstrate InteliServ, an NT Server-based application that monitors and tags information from disparate intranet and Internet sources. The software is designed to distribute that information to end users, who can choose whether they want to be notified of incoming information via E-mail, custom Web pages or on-screen alerts.

> *"Users get confused over which remote mode they should use...Applink solves that issue without a hassle," beta tester Botti said.*

IntelliServ is scheduled to ship in January.

The Sapphire Group, based in Reston, Va., will demonstrate a product that lets administrators extend the management and security capabilities of Catapult, Microsoft's yet-to-be-released NT Server-based proxy server. Proxy servers let administrators control user access to the Web and provide end users with faster Web access via caching technology.

PageBlazer for Proxy Servers lets network managers monitor all the browser requests made by users to outside Web sites as well as all page requests made of corporate Web servers. This product can intercept requests, reroute them to new locations and block access for security reasons.

PageBlazer for Proxy Servers will ship after Catapult later this year.

Pricing was not available for the products mentioned above.

©Cubix: (702) 888-1002; Cognisoft: (206) 702-0800; Sapphire: (800) 242-8719.

FOR SERVERS AND SWITCHES,
TURN TO PAGE 32.

Newbridge nabs French LAN switch maker OST

By Jodi Cohen

Kanata, Ont.

Newbridge Networks Corp. last week announced it has loosened its purse strings to acquire OST, Inc., a privately held French switch maker.

The deal — the value of which has been closely guarded — gives Newbridge OST's Xcellys ATM LAN switch chassis, as well as X.25 and frame relay technology.

Industry observers said the OST switching gear fits nicely with Newbridge's VIVID LAN products, which combine switching and routing over ATM using the ATM Forum's evolving Multi-Protocol over ATM (MPOA) standard.

But more important than the technology is the presence Newbridge will gain in the French market, one analyst said.

"Newbridge gains a tremendous distribution and support vehicle in France," said Fred McClimans, president of Current Analysis, Inc., a market analysis firm in Ashburn, Va. "And this is good for OST, which has been trying to move into the U.S. marketplace but previously lacked a massive distribution channel."

Lionel Hovsepian, vice president and general manager of the existing Newbridge French operation, becomes general manager of the merged company. Thao Lane, currently president of OST, becomes chairman.

©Newbridge: (703) 834-3600.

"Newbridge gains a tremendous distribution and support vehicle in France," Current Analysis President McClimans said about the acquisition.

Novell

Continued from page 25

tions are clear as to what they represent: in-depth knowledge of a specific version of the NetWare operating system. CNE-GroupWare is a recent addition to the program brought about by Novell's acquisition of WordPerfect's WordPerfect Office (now Group- Wise) electronic messaging system.

Novell also offers a Master CNE program. As with the regular CNE program, there are three areas of specialization — Master CNE Network Management, Master CNE Infrastructure and Advanced Access, and Master CNE GroupWare.

This program is the highest level of technical certification available from Novell and identifies an individual with the advanced skill set to handle complex problems that may involve a variety of network protocols and platforms.

The Master CNE certification requires that the individual be either CNE-NetWare 3 or CNE-NetWare 4 certified. Only individuals holding CNE-GroupWare certification can obtain the Master CNE-GroupWare specialization.

An individual possessing Master CNE-Network Management certification is capable of handling the management of multiple networks, performing system upgrades, configuring workstations, monitoring network activity and handling network printing configurations.

Someone with the Infrastructure and Advanced Access specialty can handle management of remote servers, configure routing or bridging on a network, and handle access to diverse kinds of host systems.

The Master CNE-GroupWare designates an individual who is intimately familiar with not only GroupWise, but also how it operates in conjunction with the Informs and SoftSolutions products Novell obtained via the WordPerfect acquisition.

Novell's changes to the CNE/Master CNE program did not stop with just the stratification of the certifications. The exams are moving toward a performance-based platform. The questions that a candidate will be answering will be more than just multiple choice; they will include simulations that involve using versions of the product to see if the individual knows what to do based on the information provided.

The company realizes that an individual has to continually stay up-to-date on changing technologies and trends in the industry. Courses are continually being updated and added to the curriculum to address this situation.

Nutter is a Master CNE/GroupWare CNE in the Lexington, Ky., area.

Where to turn

To verify a job candidate's CNE or Master CNE certification:

- ▶ Ask to see photo ID card issued by Novell
- ▶ Ask to see certificate
- ▶ Call Novell Education at (800) 233-3382

To obtain CNE or Master CNE program information:

- ▶ Use Novell faxback system by calling (800) 233-3382 or (801) 222-7800, choose Option 3 and request document numbers 1443 and 1444
- ▶ Check out Novell Education group's Web site at http://education.novell.com.

To get training information:

- ▶ Courses are available at Novell Authorized Education Centers (NAEC) internationally
- ▶ Independent sources such as WaveTechnologies in St. Louis at (800) 828-2050 and Big Red Self Test of Norcross, Ga., at (770) 971-8940

WIRED WINDOWS

Helping Macs and Windows 95 machines to coexist

Contrary to popular belief among the PC community, Apple Computer, Inc. and the Macintosh have not gone belly-up just yet, nor does it appear they will do so in the near future.

Macs continue to play a small but necessary part in corporate networks where they're supported by all three major LAN operating systems — NetWare, Windows NT and Warp Server.

But what about the small office, the stand-alone department or even the small branch office? A typical branch-office solution that provides both efficiency and low cost has a WAN link to the corporate network with no dedicated server machine at the branch site.

Using Windows 95 or Windows NT (or even Windows for Workgroups) as the desktop operating system, the branch office can share the resources of the corporate network. At the same time, it can rely on the desktop operating system's built-in peer-to-peer capabilities to share local resources such as printers and CD-ROM readers without having to route through corporate headquarters.

Using a Macintosh in a branch office, though, could mean having to send a document on a 3,000-mile round-trip just to print it at the printer on the desk next to yours. And that's neither efficient nor low cost.

Dave Kearns

Enter into the picture Miramar Systems with Release 6 of its PC MacLAN Windows-to-Macintosh peer-to-peer networking software. This upgrade adds Windows 95 support.

Once PC MacLAN is installed on a Windows 95 machine, all of the Macintosh computers show up in its Network Neighborhood, while the Windows 95 PC appears as a Chooser option for the Macintosh. PC and Macintosh users can then share any resources according to the rules of their own operating system.

Cross-platform printing is also supported, with drivers for Apple LaserWriters included in PC MacLAN for Windows 95 users. Macintosh users can select PostScript printers on the PC side or non-PostScript printers if third-party drivers are installed.

Since PC MacLAN supports both NDIS- and ODI-compliant client stacks, it peacefully coexists with your enterprise LAN without any additional configuration. In fact, the installation is so simple you probably wouldn't need to send a network technician to the remote site, but could simply let the Windows 95 users install it.

If you have remote sites with both Macintoshes and PCs, take a look at the amount of round-trip traffic generated on your WAN by these users simply trying to share something with another person in the same remote office. You may find that Miramar's less-than-$200 package installed on your Windows 95 PCs can save considerably on communications costs. You can learn more about PC MacLAN by visiting Miramar's Web site at http://www.miramarsys.com/.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@msn.com.

Tip of the week

When bringing up a NetWare server after a crash, I've often wanted to disable logins for everyone except the administrators' group so that the state of the server can be checked before allowing end users in. Unfortunately, NetWare only allows you to enable or disable logins for everyone. But P&A Moran, a small software house that writes server-based packages for NetWare and Windows NT, has developed Net Control, a NetWare Loadable Module that allows you to disable logins by group, among other things. You can download the software from http://www.enterprise.net/pamoran/.

Acclaim

Continued from page 25

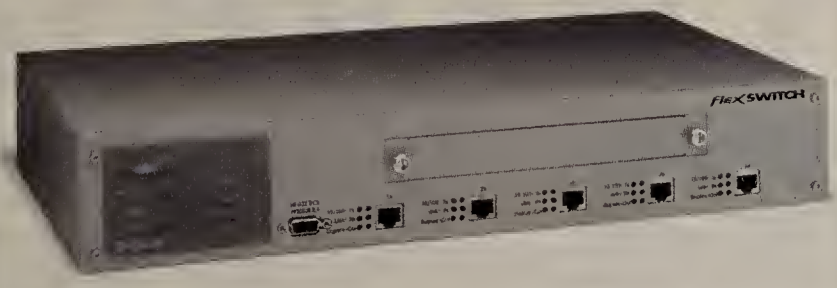
used in small and branch offices to consolidate traffic over a 56K bit/sec digital leased line, supports IP and IPX routing, and offers a 56K bit/sec CSU, two Ethernet ports and one optional voice-over-frame relay port.

Acclaim is now also offering the 3200FR, which provides a T-1 CSU, a bit-error rate tester, two Ethernet ports, two high-speed synchronous serial ports and two optional voice-over-frame relay ports. The device is designed for branch offices or corporate headquarters where managers need to consolidate LAN and legacy data over a T-1 trunk.

The 3000FR is priced at $1,995, and the 3200FR costs $3,495. Both products are available now.

©Acclaim: (408) 327-0100.

Flexible Switching and Internet Access



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INTERNETWORKING:
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DIRECTED BY MARK MILLER

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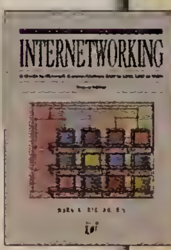
- Troubleshoot your environment through case studies that detail protocol operation and illustrate typical internetworking challenges
- Understand the key internetworking features of AppleTalk, Banyan VINES, NetWare, OS/2 LAN Server and Windows NT
- Discover some key applications for narrowband ISDN technology
- Compare the operation of ATM, frame relay and SMDS, and discover the role of the broadband implementers: the Frame Relay Forum, the ATM Forum and the SMDS Interest Group
- Understand the detailed operation and key performance characteristics of Ethernet, IEEE 802.3, token ring and FDDI
- Evaluate the differences between Transparent Bridging, Source Routing and Source Routing Transparent Bridging internetworking standards
- Utilize available software tools for network optimization and modeling process
- See how SNMP plays a key role in internetwork management including the management and operation of broadband networks
- Understand the operation of IP-based routing
- Match the LAN application with the appropriate WAN broadband technology
- Understand TCP/IP and the Internet protocol suite, including ARP, ICMP, UDP, SMTP and TELNET
- Explore the internetworking challenges of remote access and wireless communications

1996 LOCATIONS AND DATES

Dallas, TX	July 23–24	Washington, DC	Oct. 8–9
San Jose, CA	July 30–31	Atlanta, GA	Oct. 22–23
St. Louis, MO	Aug. 6–7	Boston, MA	Nov. 6–7
Irvine, CA	Aug. 20–21	Seattle, WA	Nov. 12–13
New York, NY	Sept. 11–12	San Francisco, CA	Dec. 5–6
Chicago, IL	Sept. 24–25		



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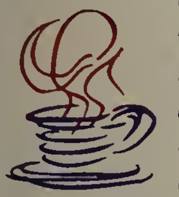
Briefs

■ **XDB Systems, Inc.** *of Columbia, Md., this week will release XDB JetConnect Pro, the newest version of its database access software for* **Java** *developers. The previous release let Java developers work with Java classes to access databases via the Open Database Connectivity interface. The new release supports Sun Microsystems, Inc.'s Java Database Connectivity interface, as well. It is free for as many as five users under an evaluation license. Pricing starts at $2,500 for 25 users.*

XDB: (410) 312-9300.



■ *Several vendors have released packages that let companies quickly deploy small data warehouses, called* **datamarts. Sybase, Inc.** *of Emeryville, Calif., now has QuickStart DataMart, which integrates its database products with warehouse and query tools from several other vendors. Menlo Park, Calif.-based* **Sagent Technology, Inc.** *has introduced its Sagent Data Mart Solution, a tools package aimed at the Windows NT market. And* **SAS Institute, Inc.** *of Cary, N.C., has released Rapid Warehouse Service Programs, consulting services aimed at assessing and deploying data marts and warehouse.*

Sybase: (510) 922-3500; Sagent: (415) 833-6800; SAS: (919) 677-8000.

■ **Transarc Corp.** *has announced a lightweight client application, DFS-Light, that lets end users access the company's Distributed File System (DFS), which is based on The Open Group's* **Distributed Computing Environment** *technology. DFS organizes files spread across a global computer network so they appear to be on a users' local disk drive. DFS-Light will be available by Aug. 31 on Windows 95 and Windows NT. Pricing starts at $150 per client.*

Transarc: (412) 338-4404.

BEA tool readies 'Net for transactions

Jolt software provides Java applets with access to middleware-based services.

By John Cox
Sunnyvale, Calif.

One of the biggest challenges facing corporate developers is the outfitting of their intranet and Web systems with features needed for large-scale transaction processing.

BEA Systems, Inc. is addressing this issue with a new product called Jolt — a set of Java client and server applications that use BEA's Tuxedo middleware to marry Web browsers with corporate applications and data.

The goal is to let companies create powerful, protected transaction systems with which browsers can easily interact.

"The Internet can't assure [transaction] integrity," said Yefim Natis, middleware research director for Gartner Group, Inc., a Stamford, Conn., market research company.

"It also lacks guaranteed delivery [of transaction messages], predictable response time, privacy and security," he said.

Jolt — which Digital Equipment Corp., Hewlett-Packard Co. and Sun Microsystems, Inc. are including in their Internet and electronic commerce products — lets the Tuxedo middleware take over these responsibilities.

Jolt is essentially a Java interface to Tuxedo-based messaging and transaction services (see graphic).

However, it also comprises server software that maintains a conversation between the client and assorted transaction servers, such as those for handling catalog orders or banking services.

The applet and Jolt server interact through the lightweight Jolt Transaction Protocol, which was designed specifically for transactions, unlike HTTP.

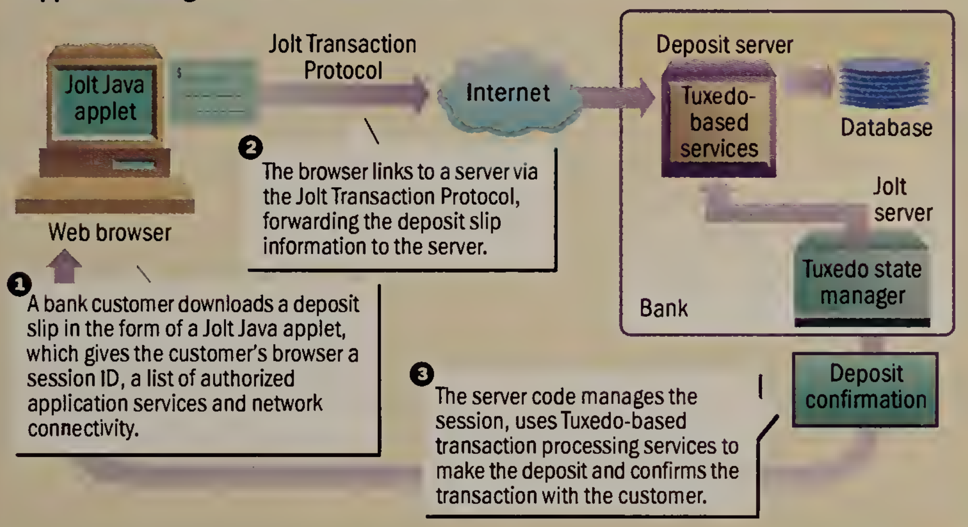
"We hope to replace our proprietary [client] front ends with a Java front end to our remote order entry system," said Chuck Nelson, technical architect at Corporate Express, Inc., a $2 billion global office supplier based in Broomfield, Colo.

The company has grown dramatically through acquisitions over the past two years and created a Tuxedo-based computing infrastructure to link these disparate systems.

With Jolt, Corporate Express could create a standard client interface and distribute it to customers via the Web. Users with Java-compatible browsers could then access the most current product and pricing information, place orders and confirm them.

Giving Internet transactions a Jolt

BEA's Jolt software combines the power of Java applets and Tuxedo middleware to support banking and other transactions.



❶ A bank customer downloads a deposit slip in the form of a Jolt Java applet, which gives the customer's browser a session ID, a list of authorized application services and network connectivity.

❷ The browser links to a server via the Jolt Transaction Protocol, forwarding the deposit slip information to the server.

❸ The server code manages the session, uses Tuxedo-based transaction processing services to make the deposit and confirms the transaction with the customer.

NetworkWorld Fusion

See how other vendors are linking Java applets and legacy applications on Network World Fusion (http://www.nwfusion.com). Select News+.

The company sees this capability as a competitive weapon and has an "aggressive schedule" to deploy Jolt, Nelson said.

Jolt enters full beta testing Sept. 30. It is scheduled for release by year-end on a range of Unix, Microsoft Corp. and other platforms.

Pricing starts at $3,000 per server.

©BEA: (408) 734-4000.

Application security

Microsoft puts signature on Internet security technology

By John Cox
Redmond, Wash.

A new digital signature technology just released by Microsoft Corp. promises to make it safer to download software over the Internet.

The technology, called Microsoft Authenticode, combines the certification of software developers with an encryption message that comes with software applications, Java applets or ActiveX Controls.

The message identifies the application's author and reveals whether the software has been changed, for example, by the infiltration of a virus.

Microsoft has submitted Authenticode to the Internet Engineering Task Force for consideration as a standard.

The company also has announced Cabinet File (CAB), technology that compresses ActiveX Controls and Java applets so they can be downloaded over the Internet much faster.

CAB will be available first for Windows and later for Macintosh and Unix.

Both technologies are included in Microsoft Internet Explorer 3.0, which started shipping last week.

Authenticode's core is an encryption technique created by VeriSign, Inc. Developers apply for a digital identification certificate from VeriSign, which establishes their legitimacy and issues the document.

Developers then can include the encrypted signature in their applications or controls before loading them onto a Web server. When Internet Explorer downloads one of these applications or controls, it reads the signature to identify the source and to check for any changes. The software loads only if it passes both checks.

"Authenticode will let corporations use digital signatures, with Internet Explorer's Administrative Kit, to define what vendors or [ID] certificates can be passed through the security firewall," said Keith Zott, Microsoft's lead product manager for Internet security.

Microsoft Internet Explorer 3.0 is available via Microsoft's Web site at http://microsoft.com.

©Microsoft: (800) 426-9400.

How Microsoft's Authenticode technology works

1. A software developer applies for and receives digital identification certificate from VeriSign.
2. The developer "signs" – incorporates digital ID code based on VeriSign's public key encryption technology– an application or component (including ActiveX Controls and Java applets).
3. Microsoft Explorer browser downloads the application and reads the ID code, confirming that the application is from an authorized source and is unaltered.

The Authenticode technology is available now in Explorer 3.0 B2 and the ActiveX software development kit, both of which can be accessed at http://www.microsoft.com.

WOULDN'T IT BE GREAT IF
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Welcome to Compaq Netelligent. It's the new line of networking products from the world's leading seller of PCs and servers. It's an idea that makes a lot of sense. More businesses use our PCs and servers in their networks for a reason. (Actually there are three: Performance. Manageability. Ease of use.) Extending this expertise to encompass networking is as natural as breathing air.

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market. And now both companies are part of Compaq.

And like everything we make, Netelligent switches, repeaters and adapters are based on open standards. So they're designed to work with your existing platform. Whatever it is.

Our vision is to provide solutions across the entire spectrum of networked computing. Netelligent is part of that vision. And over the next few months we'll be talking some more about how we plan to do it. So look for us. We should be pretty easy to find. (Of course, we're always available at www.compaq.com.)

COMPAQ

Has It Changed Your Life Yet?

[illegible] LOGIC

Can Netscape win with Netscape ONE?

With back-to-school time approaching, I decided I'd get in the spirit and do this little book review on Netscape Communications Corp.'s Open Network Environment (ONE) White Paper.

ONE's premise is that intranets are evolving into full application-development platforms. HTML and the Web page are becoming the universal desktop on which all applications execute. In fact, the once elegantly simple Web page is morphing into a universal container in which the content *is* the application.

One of the white paper's better visuals is a Web page with linked spreadsheets and pie charts. Enter the world of Java and Javascript, where applications need only be developed once, clients load and execute network-aware applets on the fly, and application deployment and maintenance costs will be reduced dramatically.

Netscape's pie chart and spreadsheet make a nice demo not only of Java, but also of LiveConnect, which provides the APIs that Java and Javascript applications on the same Web page need in order to communicate. So when you update a field in the spreadsheet, the pie chart changes in lockstep.

The Object Management Group's Internet Inter-Object Request Broker Protocol (IIOP) will extend the reach of LiveConnect, allowing applications to communicate with distributed objects anywhere. These objects could be other Java applets, or they could be existing production systems with a Common Object Request Broker Architecture interface.

ONE is nothing less than a full cross-platform operating system vision. This operating system will be layered on top of native operating systems providing direct access to hardware.

A modern operating system consists of supported protocols, APIs and objects. ONE's protocols will be SMTP, IMAP4, POP3 and NNTP. The APIs will be LiveConnect, Netscape's Client Plug-In, Netscape's Server Plug-In and a Java Runtime Interface. For objects, Netscape's Internet Foundation Classes will provide developers with a set of platform-independent user interface controls and services, such as drag and drop, windowing, multifont text, color/font choose and animation.

Daniel Blum

This puts Netscape on yet another collision course with Microsoft Corp., which expects to incorporate browser functionality in Windows by 1997. The technology collides with Windows NT, which will someday support Cairo's distributed object file system.

Netscape's pitch is that Windows and ActiveX/OLE are limiting technologies; even if you standardize on Microsoft within the enterprise, you will lose interoperability on the Internet as you try to communicate with trading partners.

If Netscape delivers, we may all be running office suites made in Mountain View. But there are lots of dots to connect before the ONE vision becomes reality.

To make Java secure enough for enterprises to bet their infrastructure on it, Netscape and Sun Microsystems, Inc. must implement signed objects. To ensure end-user acceptance, Netscape must integrate a high performance Java compiler. These are planned. However, Netscape hedges on whether it will enable its own software to be accessed using the CORBA IIOP; Netscape groupware is still sketchy; and even basic features, such as Navigator 3.0's E-mail client, need improvement.

Altogether, ONE adds up to some potent vaporware. Users will welcome Netscape's standards push and its existence as a significant Microsoft rival.

Blum is a principal at Rapport Communication, a consultancy that focuses on messaging, groupware and electronic commerce. E-mail him at dblum@interramp.com.

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June 11, 1996
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Circle Reader Service #**30**

Intranets & the 'Net

Covering: Internet Technologies and Services
for Collaboration and Electronic Commerce

Briefs

■ **Kurt Yeager** *has been named president and chief executive officer of the Electric Power Research Institute (EPRI), the Palo Alto, Calif.-based consortium that works to develop* **common communications protocols** *for the utilities. Yeager succeeds Richard Balhiser, who is retiring.*

Yeager

■ **The National Registry, Inc.** *has begun shipping a* **fingerprint-based identification system** *for access control of computers and networks. The Purdue Employees Credit Union in West Lafafayette, Ind., is using the biometric scanning peripherals to verify employee identity for access of remote computer facilities.*

The National Registry: (813) 573-3353.

■ **Vasco Data Security, Inc.** *has unveiled Internet AccessKey, a Java applet and pager-sized device that work together to* **control access to specific Web pages** *beyond using simple passwords. The Web page with the applet generates a random challenge in the form of a flashing bar code.*

The user's AccessKey token reads the bar code and generates a unique response after the user enters his personal identification number into the device. The response is read by the applet, and, upon verification, is granted access to a specific portion of the Web site.

Vasco Data Security: (708) 932-8844.

■ **Information Dynamics, Inc.** *next month will introduce Web eXpress, an* **order processing** *and fulfillment system for Web storefronts. Web eXpress lets merchants create a storefront from a centralized database containing product information and will reserve inventory for a customer.*

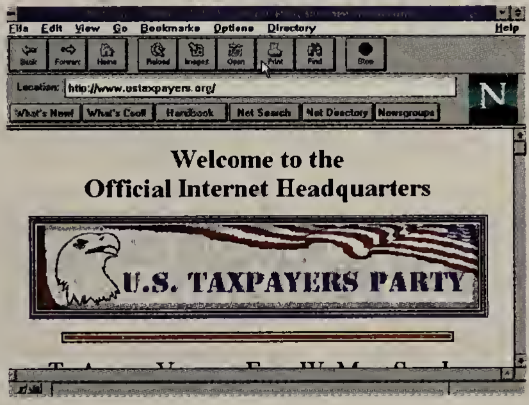
Information Dimensions: (408) 868-9700.

Fringe parties convene on Web

Lesser-known political partiers rally troops through Web suites.

By Rebecca Sykes
Boston

The Democrats and Republicans have gotten a fair amount of ink about their large Web presence. But the major political parties are not the only ones savvy to the political payoff of maintaining a Web site.



http://www.ustaxpayers.org/

Welcome to the
Official Internet Headquarters

U.S. TAXPAYERS PARTY

Obscure *party shines on Web.*

Political sites abound on the Internet, from the Unabomber for President home page at http://www.paranoia.com/unapack to the tantalizingly named but staidly left-of-center Pansexual Peace Party at http://www.neosoft.com/.eris/pppp.

Even as the U.S. braces itself for its upcoming presidential election, additional contenders are flocking to the race, bolstered by the ease and comparative low cost of setting up a Web site. "The Web is a godsend for grassroots third parties," said Bob Roth, director of communications and policy development for the Natural Law Party, which espouses the rehabilitative benefits of transcendental meditation in prisons and has had a Web presence for just under a year, at http://www.naturallaw.org/nlpusa/.

"If it wasn't for the Internet and radio talk shows, we would be invisible," agreed Perry Willis, national director of the Libertarian Party, whose slogan is, "That government is best which governs least," and whose Web site can be found at http://www.lp.org/lp/.

The issue is largely one of cost. Unlike U.S. television network airtime, which only the two major U.S. parties or billionaires such as Ross Perot can afford, the Web is free, Roth said. On the Internet, "we're on equal footing," he said.

Others agreed that the 'Net is a valuable alternative to traditional methods of stumping.

"Usenet and the Web are mass-media outlets that are available to people who don't have a lot of money," said Cameron Spitzer, Web author of the Greens/Green Party USA Web site at http://www.greens.org/usa/. The Greens, an international group in the U.S., is backing consumer advocate Ralph Nader for president.

The ability to transcend the money and monopoly hurdle has been enormously beneficial, participants said.

The Web site functions as a kind of screen, giving enough basic information about a party so that those who make contact via mail or telephone are generally more interested in and likely to participate in the party's activities, said Betty Wood, clearinghouse coordinator for the Green Party USA.

Wood handles phone, mail and E-mail inquiries for the Green Party USA and has seen E-mail generated from the party's Web site grow to 50% of communications since its inauguration in February 1995.

Another party used its Web site to call for volunteers in states where signatures were needed to get the party on the ballot.

"We used the Web to make known our ballot access needs," said Mark Weaver, executive committee member of the U.S. Taxpayers Party, which says it seeks to restore American jurisprudence to its biblical origins and constitutional boundaries, and can be reached at http://www.ustaxpayers.org/.

Links from other, mainstream sites such as alt.politics can be valuable as well, akin to getting advertising for free. "It's a way of getting more exposure," said Rafael David, Natural Law Party Web master, who estimates there are around 200 links to the party's site.

In the end, the Internet may help ease the visibility problem that confronts all organizations, political or otherwise, as they proffer their point of view in hope of gaining mainstream acceptance. "I think we've got the best dog food in town but that doesn't help if the dogs don't know it's on the shelf," U.S. Taxpayers' Weaver said.

Sykes is an IDG News Service correspondent.

'Net development

Developers work out Java kinks

By Ellen Messmer
New York

Adding Java to a Web site, whether it is on a private intranet or the public Internet, is tricky business, according to the applications developers who are learning as they go.

The Java programming language developed by Sun Microsystems, Inc. is valued because a Java applet, written once, can run on any computer with a Java virtual machine. But some Java enthusiasts say Java graphics written with Sun's Abstract Windowing Toolkit (AWT) can end up looking radically different when downloaded to a PC, Macintosh or Unix machine.

Read about a new venture-capital effort to fund Java start-ups on Network World Fusion.

Select News+.

Network World Fusion
http://www.nwfusion.com

"Something that works on a PC may not look right on a Sun machine," said Ted Young, president and chief executive officer at New York-based Advanced Web Technologies, Inc., which is designing Java applets for business use. "Buttons, for example, look different, and scroll bars don't work well in [Sun's] AWT. It's jarring to the user."

Advanced Web Technologies' *Young has to contend with differences between PCs and Sun machines when using Java.*

The AWT offers designers only three typeface fonts. "It's boring," Young said.

Sun's JavaSoft unit has promised a better version of the AWT in the next six months — one that will include Adobe Systems, Inc.'s portable font technology and a way to flow through graphics events more smoothly. In the meantime, Advanced Web Technologies has ditched the AWT in favor of a Java graphics tool kit it created itself.

Java is so new that application developers with C++, Visual Basic and SmallTalk experience typically joke that anyone with three months' experience in Java is considered an expert.

Ken Auer, a SmallTalk programmer at Cary, N.C.-based Knowledge Systems Corp., said Java is the first threaded programming language that can spawn multiple processes in the operating system.

But Java is much slower than SmallTalk in handling what's known as garbage collection — managing memory after processes are completed. "In SmallTalk, 3% of CPU time is spent in garbage collection," Auer said. "But in Java that figure can range between 20% to 50%." The result is far slower performance in Java than SmallTalk.

Java applets take a long time to download, and it is a big issue when users expect instant action after they click a mouse on a Web site.

Java developers are also worried that their work is getting ripped off by those who decompile their applets using a tool dubbed Mocha. "This problem will go away when we have code signing and compression," Young said. ■

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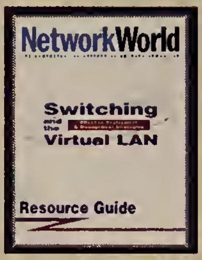

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Be helpful

While you're in the Help Desk conference on Network World Fusion, come to the aid of your peers. Here's a sampling of the topics that have been posted recently on the Fusion conference.

In Topic 69, a network manager is trying to figure out the best way to provide a user with real-time access to a database from a remote site via an ISDN line that keeps connections open only for the length of transmission.

The manager is trying to keep connect time to a minimum, so he wants the connection to break after the files have been called into the remote site.

This means he can't poll the remote bureau to confirm it is still active on the network and still owns the lock on a database record.

In **Topic 70,** an intranet designer is looking for a forms-development tool. He's creating an intranet for several companies and needs to serve up purchase orders that come on preprinted forms from an IBM mainframe. He says he can get the data via File Transfer Protocol, but without the forms flash, it is meaningless.

In **Topic 71,** another network administrator is having problem working with Macintoshes. He queries: "Why do my Macs see the SYS volume fine, but no amount of struggling will convince them to find SYS1?" The administrator says that he goes to the Chooser program, selects AppleTalk, then picks the correct zone. All the servers appear correctly, but when he logs in, he only sees the SYS volume. No other volumes are shown, not even grayed out, he says.

In **Topic 72,** a manager wants to view Network General Corp. Sniffer traces offline. The manager is looking for shareware packages that make this possible.

If you have any suggestions, drop these folks a line on Network World Fusion (http://www.nwfusion.com). Go to Forum, then click on Help Desk.

Cost, performance play big role in SNA over frame relay choice

IBM routing protocol and IETF standard carry legacy data over frame relay.

By Paul Wallner

It's 1996 and the IBM mainframe lives, often alongside LANs and multimedia applications in large branch networks.

If you need to get that legacy data — particularly SNA traffic — from one corporate location to another, your choice centers on frame relay transport using either Data Link Switching (DLSw) or RFC 1490-compliant technologies.

The biggest difference between the two is that DLSw involves the encapsulation of SNA in TCP/IP, and the IETF's RFC 1490 standard provides a way to transmit SNA natively. The impact on reliability and overall network costs of each technique depends on the environment.

Developed by IBM for use in IP routers, DLSw assumes an IP backbone. Its use has been extended to frame relay WANs on which IP-based LAN traffic is commingled with SNA.

In contrast, RFC 1490 was designed to supplement the error-correction capabilities of frame relay so that time-sensitive protocols such as SNA and other legacy data could be transported across the WAN. Although RFC 1490 applies specifically to frame relay, it also works well in multiprotocol environments where ATM, ISDN and other dial-up services might be used.

DLSw specifics

DLSw, because it was developed for IP routers, is best used when LAN traffic predominates over legacy data or when time sensitivity, data integrity and bandwidth utilization are not critical networking issues.

With DLSw, each SNA packet is encapsulated in IP for routing and in TCP for error recovery, creating headers of no less than 56 bytes.

Then the standard 10-byte frame relay header is added, which can bring the total overhead to nearly the same size as the packet itself. This added overhead can seriously impact bandwidth utilization.

On lower-speed frame relay links, the addition of 56 bytes of TCP and IP headers to the comparatively short SNA headers slows transmission significantly and disrupts the deterministic timing SNA requires. Such delays between end devices on the WAN can cause sessions to be dropped.

DLSw also requires that two TCP sessions — one to send data and one for communications between routers — be established for each transmission. Because SNA networks often consist of more than 500 nodes and most backbone multiprotocol routers can only support a few hundred concurrent SNA sessions, performance and session integrity can easily become jeopardized during peak traffic periods. Data delivery also can be further compromised because DLSw does not provide a means of prioritizing traffic or the ability to support hot backup configurations. If one destination router fails, all sessions are disrupted.

Results of recent tests conducted by The Tolly Group indicate that IP routers do a poor job in general of transporting SNA over frame relay. Congestion and overload at central routers can lead to SNA session timeouts, dropped frames and exorbitant bandwidth consumption due to encapsulation overhead, the tests show.

If, in fact, the objective in using frame relay is to minimize carrier costs, the excessive overhead created by the encapsulation of legacy data by DLSw presents a big problem. The large headers offset savings and cause poor performance.

RFC 1490 breakdown

When legacy protocols are equally important to, or more so, than LAN data, RFC 1490 solutions are often the best choice for guaranteeing data integrity and timely delivery of information while maximizing the savings potential of frame relay.

With RFC 1490, SNA and other legacy protocols are transmitted natively across frame relay-based WANs. Only 10-byte frame relay headers are required, so a lot of additional overhead is not being generated.

RFC 1490 safeguards SNA with congestion management and flow control features. Using forward and backward explicit congestion notification messages, RFC 1490 devices can control traffic flow effectively with no loss of data during peak congestion.

With native SNA, 802.2 Logical Link Control 2 provides error recovery and some access devices use other techniques to regulate traffic flow and bolster reliability. Among these capabilities are frame relay switching, protocol prioritization and dial backup.

NetworkWorld Fusion

For further analysis of DLSw vs. RFC 1490, go to Network World Fusion (http://www.nwfusion.com).

RFC solutions can improve bandwidth utilization by 50%, bringing down costs substantially.

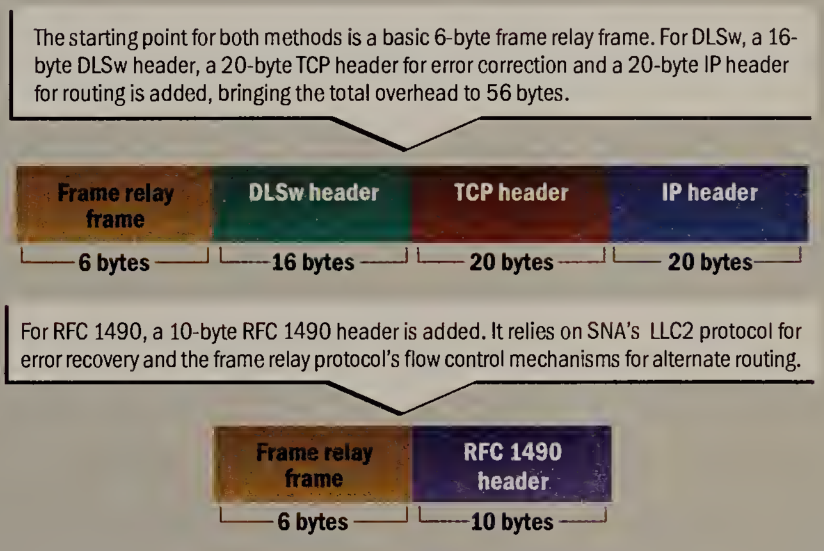
In networking, as in everything else in life, one size does not fit all. In general, performance, reliability and cost are often the three most important issues. The choice between DLSw and RFC 1490 hinges on the relative importance of timely delivery of legacy data, as well as the goals for achieving savings by using frame relay.

Wallner is president of Hypercom Network Systems, the branch networking division of Hypercom, Inc. in Phoenix. He can be reached by phone at (602) 504-5144 or via E-mail at pwallner@hypercom. com.

UP CLOSE

A matter of overhead

When it comes to choosing a method for transporting SNA and other legacy data over frame relay links, you need to know what you're sending so you can determine how efficient the approach. Here's a look at a typical Data Link Switching (DLSw) and RFC 1490 packet.



The starting point for both methods is a basic 6-byte frame relay frame. For DLSw, a 16-byte DLSw header, a 20-byte TCP header for error correction and a 20-byte IP header for routing is added, bringing the total overhead to 56 bytes.

For RFC 1490, a 10-byte RFC 1490 header is added. It relies on SNA's LLC2 protocol for error recovery and the frame relay protocol's flow control mechanisms for alternate routing.

Given the overhead associated with DLSw, it is best used when LAN traffic predominates over legacy data or when time sensitivity, data integrity and bandwidth utilization are not critical networking issues. RFC 1490 works well in environments where an even mix of LAN and legacy data needs to be carried across the wide area.

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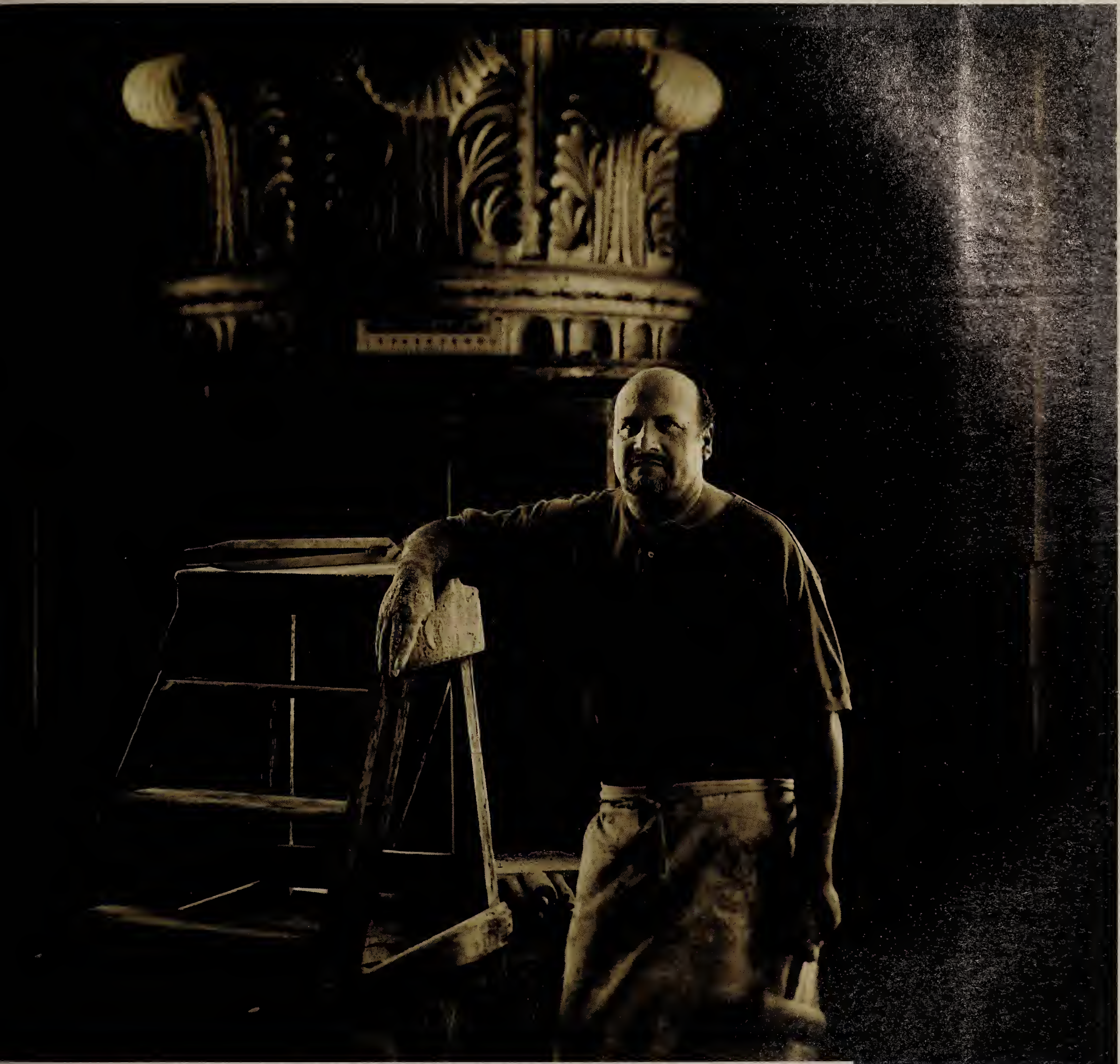

Gladding McBean & Co. has been making architectural terra cotta since 1875. But just because they're an older company doesn't mean they act like one. When they joined Pacific Coast Building Products, Inc., Pacific Bell helped them integrate their separate locations throughout California. Recently we recommended they convert to a Pacific Bell Frame Relay network to improve communications reliability, cost control and disaster recovery capabilities. It also helps them stay ahead of the competition. Frame Relay is available through FasTrak℠, a collection of high-speed data and video services from Pacific Bell. They include Frame Relay, ATM Cell Relay and SMDS – products that are helping innovative businesses throughout California stay on the cutting edge. *Call 1-888-327-8725 to learn more about FasTrak.*

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EDITORIAL INSIGHTS

A word to the wise (vendors)

"SNMP has delivered significant value but it has hit the wall."

That's a remarkable statement, particularly coming from Marshall Rose, one of the developers of the venerable SNMP management technology and keynoter at *Network World*'s Managing Enterprise Networks & Systems Conference last week.

Let me be very clear that Rose isn't sounding SNMP's death knell. Far from it. His point is that SNMP has gotten very good at solving the problem for which it was designed: providing lots of information on many devices in a common format. But other approaches, particularly Web-based management, are required to bring network management to its next level.

Rose astutely pointed out an ironic aspect of SNMP's ascendancy. By forcing vendors to embrace a common approach to presenting data, the SNMP standards effort has provided a disincentive for them to deliver unique management tools. To paraphrase, in this SNMP world, we have lots of instrumentation but little innovation. Hardly what we need as the demands on our networks multiply.

Enter Web-based management as a way for vendors to provide, as Rose calls it, "an open interface to proprietary functionality." By providing a common front end to applications, the Web actually gives vendors an incentive to compete by providing powerful new management features in their network devices without complicating life for the user. SNMP can provide the nitty-gritty details on the network's health, while Web-based tools can provide rich new functions that add value to devices.

Like all cures, this one may have some side effects. For example, putting Web server-based management applications in, say, hubs or routers could tax the processing power or increase the price of the boxes. It could also tax administrators who would have to learn a whole new slew of vendor-specific applications.

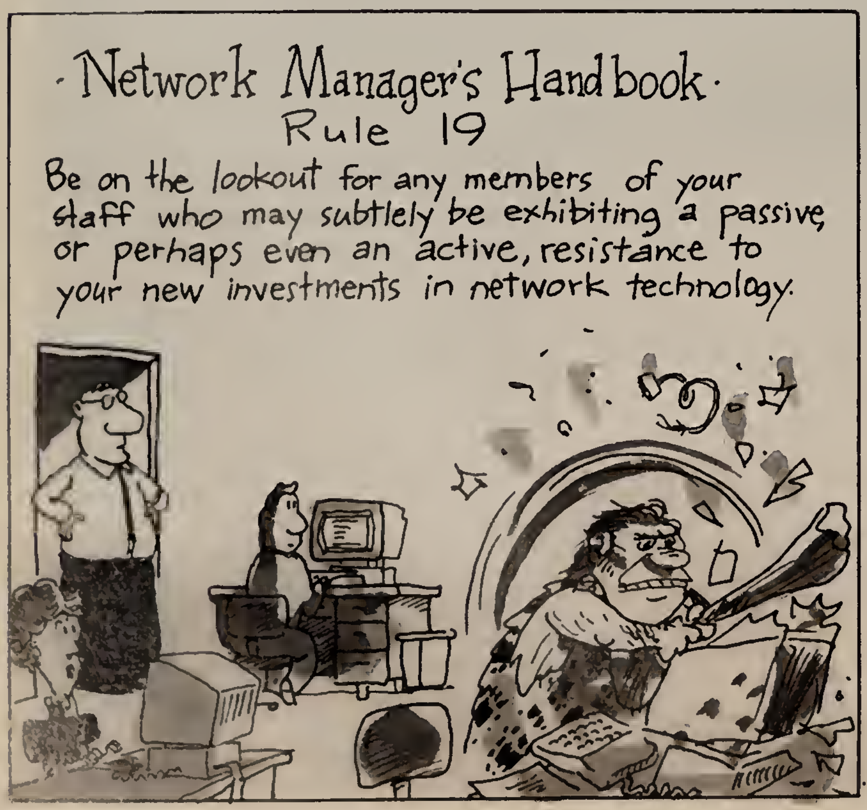
The bigger problem may be that vendors just don't understand how the Web has changed the management game. Too many view the Web as just another means for getting at SNMP data, solving a problem we've already solved.

My hope is that Cisco or another industry leader will quickly pick up on this opportunity for profit and innovation. Because innovation is sorely needed in network management.

John Gallant, editor in chief jgallant@nww.com

Teletoons

By Phil Frank and Joe Troise
baba@sfgate.com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Rule 19
Be on the lookout for any members of your staff who may subtlely be exhibiting a passive or perhaps even an active, resistance to your new investments in network technology.

NETWORK CONVERGENCE

Packaged solutions require a new set of management skills

Mary Johnston Turner

Packaging. Most of you probably think of it as the exterior wrapper you throw away after you open a new piece of equipment. It's extraneous — something you avoid or dispose of.

The same mentality has, until recently, pervaded the way many IT managers think about buying network and systems management functionality. Many managers believe it is their job to buy components — tools, transmission facilities, software and so forth — and put them all together in the best possible way to meet their enterprise's needs.

Managers who don't feel they have the in-house skills to do this integration — or packaging — turn to third parties that provide soup-to-nuts outsourced management and customized support services, often on a time and materials basis. This strategy works fine for Fortune 500 companies, which have the staff and bucks to throw at such complex problems. They craft five- to 10-year partnerships, negotiate hard for the best price possible and hold service providers to stringent quality-of-service agreements backed by financial penalties for failure to perform.

The choice to go with a packaged offering certainly involves a tradeoff analysis between the package's inherent limitations and the time to market/cost of deployment for the perfect solution.

By comparison, the rest of corporate America — companies too small to successfully go eye-to-eye with big outsourcers — has lagged behind.

Recent moves by service providers such as AT&T and third-party outtasking suppliers such as Inacom Corp. indicate that the ability for midsize companies — the Fortune 5000 — to take advantage of complex integrated technology solutions may be about to get much easier.

AT&T, for example, plans to offer a number of prepackaged electronic commerce services designed specifically for the needs of individual vertical markets (July 22, page 1). These services build on existing packages such as AccuWAN to include Web host design and server support services. For a predefined fee, customers can purchase a tightly defined set of capabilities.

Along the same lines, Inacom has introduced a prepackaged asset/configuration baselining and ongoing configuration validation service called RollCall. It is priced on a per-device basis, allowing customers to fix the cost of their investment up front.

RollCall is the first of what Inacom says will be a full line of network and systems performance monitoring, analysis and design services to be offered on a highly packaged basis. Expect more of these types of packages, from a variety of service suppliers, to hit the market in the next 12 months.

Just as software purchasing gradually has moved from totally proprietary development to off-the-shelf packages, network and systems support services are on the verge of a similar shift. Instead of buying components, you will increasingly be buying packages of facilities, management tools, server and application services, and integration services.

As with any packaged offering, these services may not fulfill 100% of your company's wish list. However, they're likely to provide 90% of the desired functionality within a time frame and at a price your organization could never have achieved using its own people and skills base.

The choice to go with a packaged offering certainly involves a tradeoff analysis between the limitations inherent in the package and the time to market/cost of deployment for the perfect solution. Upon conducting such an analysis, you may find yourself willing to give up some dream features for a packaged solution that is quick to implement and relatively affordable.

The availability of more predefined, standard-priced, packaged solutions reinforces the ongoing need for the IT manager to develop a higher level of analytic, negotiation and contract management skills, rather than hands-on operational capabilities. With the shift away from a component focus and toward a solutions focus, it's more important to become a strategic thinker than a virtuoso component operator.

Buying and managing packaged services requires competence in contract negotiation, defining service-level agreements and monitoring the progress of your vendor. Defining what is an acceptable implementation up front is key to success.

Equally important is the liaison function between your internal users and the third party. The biggest possible downside of packaged offers is that by their very nature they must be geared toward standard desktops, servers and network configurations and architectures. If every department or desktop operates a little differently within your organization, you'll find it hard, if not impossible, to take advantage of packaged services.

The move to standardized platforms and desktops is key to realizing major cost reductions and delivering consistent service levels. If you cannot build internal acceptance for this type of environment, it's unlikely your firm will benefit from packaged offerings.

Your value as an IT manager will, in the near future, be judged more by how well you negotiate internally and externally and manage third-party relationships, than on your ability to diagnose a problem in a particular device or system. If you prefer to focus on operational leadership and excellence, maybe it's time to send your resume to a service provider.

IT managers at Fortune 500 companies have been realigning their managerial skills for some time. With the emergence of packaged support services and outtasking offerings, Fortune 5000 IT managers get to join the party.

Turner is a vice president with Northeast Consulting Resources, Inc., a Boston-based consulting company. She can be reached at (617) 654-0619 or via the Internet at turner@ncri.com.

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91	92	93	94	95	96	97	98	99
100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117
118	119	120	121	122	123	124	125	126
127	128	129	130	131	132	133	134	135
136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153
154	155	156	157	158	159	160	161	162

MARKETPLACE

163	164	165	166	167	168	169	170	171
172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189
190	191	192	193	194	195	196	197	198
199	200	201	202	203	204	205	206	207
208	209	210	211	212	213	214	215	216
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280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297
298	299	300	301	302	303	304	305	306
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37	38	39	40	41	42	43	44	45
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55	56	57	58	59	60	61	62	63
64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81
82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99
100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117
118	119	120	121	122	123	124	125	126
127	128	129	130	131	132	133	134	135
136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153
154	155	156	157	158	159	160	161	162

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163	164	165	166	167	168	169	170	171
172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189
190	191	192	193	194	195	196	197	198
199	200	201	202	203	204	205	206	207
208	209	210	211	212	213	214	215	216
217	218	219	220	221	222	223	224	225
226	227	228	229	230	231	232	233	234
235	236	237	238	239	240	241	242	243
244	245	246	247	248	249	250	251	252
253	254	255	256	257	258	259	260	261
262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279
280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297
298	299	300	301	302	303	304	305	306
307	308	309	310	311	312	313	314	315
316	317	318	319	320	321	322	323	324

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TOLLY ON TECHNOLOGY

ISDN to the branch office: Theory meets reality

Kevin Tolly

In theory, usage-sensitive ISDN should be the ideal network transport whenever limited connection durations are needed. Its quick connections, relatively high speed and by-the-minute billing have proven to be a winning combination for applications such as videoconferencing and telecommuting.

Unfortunately, router vendors also tout ISDN for use as the primary connection between headquarters and small branch offices. In the abstract, this should be a perfect fit. The reality, however, is closer to a dismal failure.

More than once, I have written about the potential for problems in this area. Recently, I heard from the network manager of a West Coast firm who experienced these problems firsthand.

In order to cut branch-office WAN costs, this net manager took his router vendor's advice and replaced a leased line with ISDN. The branch office required an estimated total of one hour per day of connect time to exchange E-mail and files. Given ISDN's usage-based pricing, WAN costs were projected to drop from $1,500 to $300 per month when ISDN replaced the leased line.

When the first ISDN bill arrived, however, the ISDN connectivity costs were an astounding $16,000. What happened?

The fatal mistake was in presuming that 10 minutes per hour, say, of business need for connectivity was going to translate into anywhere close to 10 minutes per hour of ISDN usage. LAN client/server and routing protocols, such as NetWare's Server Advertisement Protocol and Routing Information Protocol, were designed for campus or leased-line WAN environments where all devices remain online at all times. ISDN has to mimic that environment by simulating a permanent connection even when there isn't one and triggering an actual connection when one is required.

If this sounds complicated, it is. That is why I advise my consulting clients to forget about using ISDN as a primary branch-office link. Here are my reasons:

■ **Spoofing will remain unreliable.** The only way to control costs is to have the router deactivate the ISDN link whenever possible. It must do this while simultaneously making all connected clients, servers and routers continue to see the network connection as active.

Given the inherent complexity of the task and the number of protocols that must be spoofed — not to mention the lack of standards — spoofing is destined to continue to develop primarily through trial and error. Implementations will inevitably be proprietary and thus vary from vendor to vendor. Ultimately, spoofing will continue to be more art than science — and a black art at that. This most necessary component of branch-office ISDN connectivity will likely never prove enterprise-ready.

■ **Lack of usage-monitoring tools.** Historically, routers communicate over permanent connections on both LAN and WAN interfaces. Usage does not affect the cost of such connections. Thus, router vendors have devoted little if any effort to building tools that allow network managers to track usage. This situation is unlikely to change very much.

As a result, network managers who adopt ISDN find themselves nearly blind when trying to determine not only the actual usage, but, more importantly, who or what caused that usage. They have no way of cutting off excess usage and capping their WAN costs.

■ **Complexity erodes cost savings.** We have heard about cost of ownership from various industry analysts of late. The fundamental message is always the same: Support costs usually dwarf capital costs.

Establishing ISDN connections to branch offices requires substantial effort. Worse, given the dynamic nature of corporate networks, a branch-office ISDN connection that is functioning properly one day can suddenly be up for hours on end as the result of a particular protocol being introduced in another part of the network.

Thus, the router vendor will never be able to assure the network manager that once operational, things will remain just fine. The cost of the time spent monitoring the ISDN connection with few sophisticated tools will likely eliminate any actual savings in WAN costs.

This is not an attack on ISDN. It is simply a reminder that just because a particular technology — be it ISDN, ATM or something else — can deliver good results in one area, those same results are not guaranteed everywhere. Using technology the way it was intended to be used is what guarantees good results.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (908) 528-3300 or via the Internet at ktolly@tolly.com.

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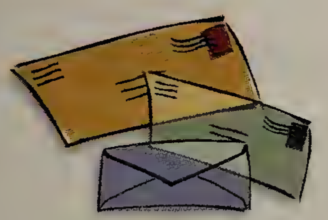

QUEUE

Cisco disagrees

Paul Wickre's column "Stick to true standards-based solutions" (July 22, page 39) misrepresented Cisco Systems, Inc.'s product set.

Cisco offers many more options than those listed in the column, all of which are RFC 1490-compliant. We also offer a suite of frame relay access devices (FRAD) that address serial-only and mixed serial/LAN environments.

Cisco's SNA over RFC 1490 solutions include support for Boundary Network Node, which allows a Cisco FRAD to connect directly to a front-end processor (FEP) using the routed format of RFC 1490, and Boundary Access Node, which allows a Cisco router to connect directly to a central-site FEP using the bridged format of RFC 1490.

Cisco also supports direct Advanced Peer-to-Peer Networking over the routed format of RFC 1490, allowing support for SNA class of service (COS) at remote sites.

Many enterprises have requirements beyond what is defined in RFC 1490, such as local acknowledgment, nondisruptive rerouting and branch-to-branch communication. To address these requirements, many vendors offer vendor-specific extensions to RFC 1490. Cisco, on the other hand, has chosen to use Data Link Switching (DLSw) to provide a standard way to address these advanced requirements.

In addition, since DLSw adds 40 bytes of TCP/IP to every frame, Cisco also offers DLSw Lite, which uses Logical Link Control 2 (LLC2) instead of TCP/IP to provide similar functionality with less overhead. While LLC2 transport has not yet been standardized, it is an alternative under discussion in the DLSw standards bodies.

Cisco FRADs are designed for SNA networks. They offer extensive SNA management from either NetView or an SNMP management station, as well as value-added features such as SNA COS and downstream physical unit concentration.

Contrary to what was stated in the column, Cisco offers high-density serial FRADs in addition to LAN FRADs. All of Cisco's SNA FRADs can be easily upgraded to full routing solutions or to SNA solutions over alternate WANs such as ATM.

Many FRAD vendors either have a point solution that must be thrown away when requirements change or they are playing catch-up to add routing functions. Their routing function is bare bones and unproven, and their WAN support is limited to frame relay.

Cisco has hundreds of customers and about 100,000 routers and FRADs in the marketplace transporting SNA. Our technology is proven.

See **Message queue,** *page 48*

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New level of cache flow

A monthly feature in which we evaluate file and application servers, based on tests conducted in a lab owned jointly with our sister publication, PC World.

By William L. Rinko-Gay and Lee Schlesinger

This month's batch of servers includes a top-end enterprise unit from Compaq Computer Corp. and workgroup models from AST Research, Inc. and Digital Equipment Corp.

The Compaq ProLiant 5000 6/200 was a bit disappointing in its performance numbers, despite being the first Pentium Pro server we've looked at with a 512K-byte Level 2 cache. This larger cache is so new that it won't be available in production units for a couple of weeks.

Of the two workgroup servers, the Digital Prioris HX 5166's performance was good enough to make it one of the top three servers we've tested, right next to its sibling, the Prioris XL. AST Research's Manhattan S6200 just missed cracking the top five. But taking price into consideration to arrive at a price/performance measure of value, both servers fall in the lower half of the 12 workgroup servers we've tested to date.

WORKGROUP SERVER

Manhattan S6200

VENDOR: *AST Research*
CONTACT: *(714) 727-4141*
PRICE: *$8,225*
PERFORMANCE RATING: *33.8*

PRICE/PERFORMANCE INDEX 243

A lower number indicates better value. The best ratio to date is 143 while the poorest is 370.

We were excited to get our hands on AST's Manhattan S6200 because it was the first workgroup Pentium Pro server we'd seen. However, the server was a bit of a disappointment in terms of performance. With the exception of the CPU-bound database test under NetWare, it was not what we expected from a Pentium Pro.

The model we tested is sleek, in its large black tower. We had to pull open the cover to access the power switch, which is a mixed blessing: It's a bit of a pain, but at least passersby won't be tempted to toy with it. And the cover can be locked shut, which blocks access not only to the power switch, but to external drives, inside slots and such.

All the software we needed came pre-installed at our request. Good thing, because AST offers no CD-ROM or documentation to help with software installation. For administration experts, this is fine, but newcomers might prefer some help.

The bundled software includes Intel LANDesk Server Manager, but it doesn't include the Server Monitor Module ISA board. Therefore, some hardware statistics won't be available. If you want the card, you have to shell out extra for it.

Also included is a pair of courses on CD-ROM from CBT Systems with a license for two concurrent users. AST provides Support Fundamentals for Windows NT 3.5x: Basic Configuration and NetWare 4.1 Advanced Administration: Network Server Optimization.

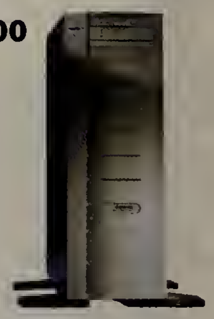
The documentation was a good bundle, with a few caveats. With the exception of the Intel EtherExpress Pro network adapter manual, everything is republished by AST. While the LANDesk Server Manager User's Manual is thorough and functional, it is republished in black and white, making some graphics difficult to read. The AMIDiag system diagnostics software and System User's manuals also lack color, but they're far more readable because they were designed for monochrome publication.

Overall, this is a solid server with a good mix of original design and third-party hardware. The fact that it's upgradable to two processors is a big plus. The performance wasn't what we'd hoped, but it is usual for a complex server with a new processor such as the Pentium Pro to need tweaking before performance is fully optimized.

ENTERPRISE SERVER

Proliant 5000 6/200

VENDOR:
Compaq Computer Corp.
CONTACT:
(713) 370-0670
PRICE: *$32,669*
PERFORMANCE RATING: *44.9*



PRICE/PERFORMANCE INDEX 728

A lower number indicates better value. The best ratio to date is 407 while the poorest is 1,215.

Despite its powerhouse packaging with four 200-MHz Pentium Pro CPUs, the Compaq ProLiant 5000 6/200 was not a performance giant, except in database testing. Its results in Lotus Notes and file server testing were comparable to other enterprise servers we've tested, but it led the pack in Oracle database testing under NetWare.

The server is well engineered for management but surprisingly a little light in performance. With the most

PERFORMANCE LEADERS TO DATE

Our performance rating is derived by adding the file server performance in scripts per minute to the average of the two application server test results at the 16-client level.

Enterprise servers	Issue tested	Top performance
HP NetServer 5/166 LS4	5/27/96	55.4
ALR Revolution Quad6 166/512	7/22/96	54.8
IBM PC Server 720	5/27/96	53.1
Data General AViiON AV 4900	7/22/96	51.1
Compaq ProLiant 5000 6/200	This issue	44.9
Workgroup servers		
Compaq ProLiant 1500 5/133 Model 2100	6/24/96	45.8
Digital Prioris XL Server 5133	4/22/96	41.5
Digital Prioris HX 5166	This issue	41.4
HP NetServer 5/133 LH	2/19/96	38.6
AcerAltos 900	6/24/96	36.5

VALUE LEADERS TO DATE

We divide the price of the server as tested by the performance rating to get our price/performance index. A lower number indicates better value.

Enterprise servers	Issue tested	Price/ performance Index
Tangent Carthage	5/27/96	407
IBM PC Server 720	5/27/96	518
HP NetServer 5/166 LS4	5/27/96	531
ALR Revolution Quad6 166/512	7/22/96	603
Compaq ProLiant 5000 6/200	This issue	728
Workgroup servers		
Digital Prioris XL Server 5133	4/22/96	143
AcerAltos 900	6/24/96	147
Dell PowerEdge SP 5133-2	5/27/96	161
Unisys Aquanta ES	7/22/96	173
Compaq ProSignia 500 Model 5/120-2100	2/19/96	175

NetworkWorld PC WORLD
SERVER TEST SERIES

advanced Pentium Pro processor currently available, one might expect the server would have done better in each application category.

However, the performance is reasonable, and the management features make this an excellent enterprise server.

Compaq bundles its SmartStart NOS installation package and Insight Manager administration software, which allows an administrator to use SNMP-based management tools to monitor the server remotely.

The chassis is the same as the ProLiant 1500 we reviewed in June, with some minor changes to accommodate the four Pentium Pro Processors. Inside the large housing, the ProLiant 5000 6/200 offers easy access to all slots, DIMMs and processor sockets. On our test machine, two processor cards each had two processors installed. These cards and the DIMM cards are behind an easily removed support cage. If the machine were just a little longer from front to back, Compaq could have fit in at least three more drive bays. There's an excellent configuration label inside the door.

Two large fans plus one in the power supply provide cooling. The lockable front bezel swings open to provide access to five hot-pluggable drive bays. Drives latch in securely, but Compaq uses full-height drives, limiting the number that can be used. Drive activity

Download complete server test results and more details of our test methodology. Select NetRef, Buyer's Guides and Reviews, then Server Test Series.

Network World Fusion
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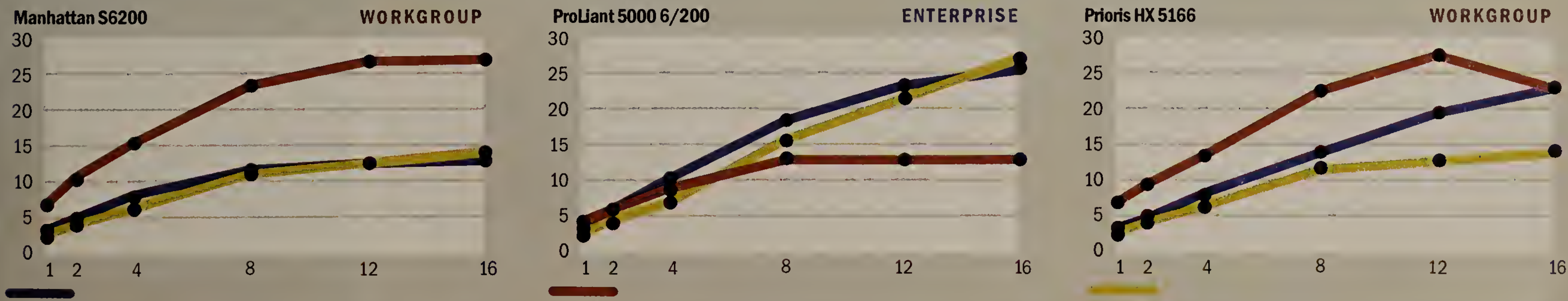
The inside story

Vendor	**AST Research, Inc.**	WORKGROUP	**Compaq Computer Corp.**	ENTERPRISE	**Digital Equipment Corp.**	WORKGROUP
Model	Manhattan S6200		ProLiant 5000 6/200		Prioris HX 5166	
Processor	200-MHz Pentium Pro with 256K-byte Level 2 cache		4 200-MHz Pentium Pros with 512K-byte Level 2 cache		166-MHz Pentium with 512K-byte Level 2 cache	
Max. processors	2 200-MHz Pentium Pros with 512K-byte Level 2 cache		4 200-MHz Pentium Pros with 512K-byte Level 2 cache		2 200-MHz Pentiums with 512K-byte Level 2 cache (available 9/96)	
Memory	**As tested**	**Maximum**	**As tested**	**Maximum**	**As tested**	**Maximum**
	32M bytes	256M bytes	128M bytes		32M bytes	256M bytes
Slots	**Provided**	**Open**	**Provided**	**Open**	**Provided**	**Open**
PCI	5	3	6	2	6	6
PCI/EISA	1	1	1	0	0	0
EISA	2	2	1	1	6	4
Memory	0	0	0	0	0	0
Processor	1	1	2	0	0	0
ISA	0	0	0	0	0	0
Bays	**Provided**	**Open**	**Provided**	**Open**	**Provided**	**Open**
Internal	3	1	4	0	7	5
External	6	5	3	1	4	2
Storage						
Adapter	Mylex DAC960		Compaq Smart-2 Array Controller		Mylex DA960 RAID adapter	
Bus	PCI		PCI		PCI	
Capacity	2G bytes		8.4G bytes		4.2G bytes	
Model	Seagate Barracuda ST32550W		Seagate Barracuda ST15150W		Seagate Barracuda 32550W	
Maximum drive capacity	**Internal**	**External**	**Internal**	**External**	**Internal**	**External**
	24G bytes		17.2G bytes	361G bytes	37.8G bytes	476G bytes
CD-ROM	4x SCSI		Sanyo CRD-254V 4x SCSI		Bootable 4x	
Network adapter	Intel EtherExpress Pro 100/B		4 Netelligent 10/100 TX PCI		Digital PCI Ethernet 10/100	
Fault tolerance features	ECC RAM		ECC RAM, hot-pluggable drives, RAID 5-capable controller		Hot-swappable drives, optional RAID controller, optional ECC RAM, Digital Clusters for Windows NT available, dual redundant power supplies, redundant cooling	
Security features	Password protection, bezel keylock		Passwords, bezel keylock, controls for diskette drive, parallel and serial ports		Chassis lock for drives and bays, access lock, passwords	
Bundled software	Intel LANDesk, CBT Courseware, Windows NT Server on some models		Systems Reference Library, SmartStart, Support Software (drivers, configuration utilities, diagnostics, demos), NetWare Web Server, Microsoft Internet Information Server, Compaq Insight Manager		ServerWorks Manager, ServerWorks Quick Launch	
Miscellaneous	7x24 toll-free support with staffing to servers; 3-year on-site support; 4-hour on-site support optional		7x24 toll-free support; 3-year on-site support; Compaq Care support option eliminates finger-pointing		7x24 toll-free supoort; 3-year on-site next-day response; non-ECC memory starts at 16M bytes and can go to 512M bytes. Tested with asynchronous burst cache, pipeline burst available.	

PERFORMANCE SUMMARY

We measure performance from the client's point of view and report the time it takes to complete typical tasks. Our performance summary graphs show the results of each test in scripts per minutes, with numbers of clients ranging from one to 16. Because the tests run faster than a real client could perform the operations, each of our test clients stresses the servers as much as several real users would.



FILE SERVER Our file server tests run scripts on ascending numbers of clients for four applications: Microsoft's Word and Excel for Windows, Lotus' 1-2-3 for Windows and Corel's WordPerfect for Windows. The scripts perform file-access operations, such as opening, importing and saving files.

DATABASE We have two application server tests. The first is a client/server database test that uses Microsoft Access on the front end and Oracle Workgroup Database 7.2 on the back end. We perform various read and write operations on a three-table payroll management application.

LOTUS NOTES The other application server test uses Lotus Notes Release 4.0. We access multiple views in a database, then each document within each view.

LEDs are easy to see.

Printed documentation, what little there is of it, comes from Compaq and is of good quality.

It gives enough information to get the machine up and running and to handle typical start-up problems.

It also covers installing options and running bundled software. A configuration CD contains the rest of the documentation.

WORKGROUP SERVER

Prioris HX 5166

VENDOR: *Digital Equipment Corp.*

CONTACT: *(800) 344-4825*

PRICE: *$8,462*

PERFORMANCE RATING: *41.4*

A lower number indicates better value. The best ratio to date is 143 while the poorest is 370.

PRICE/PERFORMANCE INDEX 204

The Prioris HX 5166 costs more than the Prioris XL we looked at in April. For the extra money, you get a mixed bag in performance but increased reliability.

The server came with NetWare and Windows NT Server preinstalled. DEC offers no automated support for installation of operating systems.

This model did exceptionally well in our NetWare tests. Its file server score is the best we've seen so far among workgroup servers and, despite its relatively modest 166-MHz Pentium processor, its database scores tied for first with the Pentium Pro-based Manhattan S6200.

Running Windows NT Server, the Prioris HX 5166 performed well as a file server but only modestly in the application tests.

This double-width minitower is similar in shape to the HP NetServer family. On the left as you face the server are the external drive bays and the electronics. On the right, you'll find the hot-pluggable drive bays. The external drives and the hot-pluggable bays are under plastic covers that can be locked.

The hot-pluggable drives are a little difficult to remove. Tabs on the outsides of the drives have to be squeezed together while you're using them to pull the drives out. The tabs are too small to make good pulling handles. We did get the drives out, but it took a bit of effort.

On the inside, SIMMs are easy to replace without having to remove any parts. The CPU card can be removed after taking out a single screw. The unit is expandable with 10 open slots, six of which are PCI slots.

This system was designed for redundant operation. A Mylex Corp. DAC960 controller card allows for RAID 5 capability. An optional redundant power supply can be installed so that the system can be plugged in to a second circuit. Two fans outside the power supplies typically keep the system cool. Two spare fans will start spinning if anything stops the main two.

Digital's documentation is complete and well done. The Server User's Guide, configuration and options manual, and ServerWorks documentation are useful, with a reasonable balance of technical detail and user friendliness.

Digital bundles ServerWorks and ManageWorks for server and workgroup management.

ServerWorks is a graphical program that allows management of such features as CPU and file system utilization, and network interface information. It can autodiscover SNMP devices on the network and set alarms and alerts on the above listed events.

ManageWorks allows management of distributed servers and other SNMP-compliant systems. It can also manage LAN Manager servers and Novell NetWare servers.

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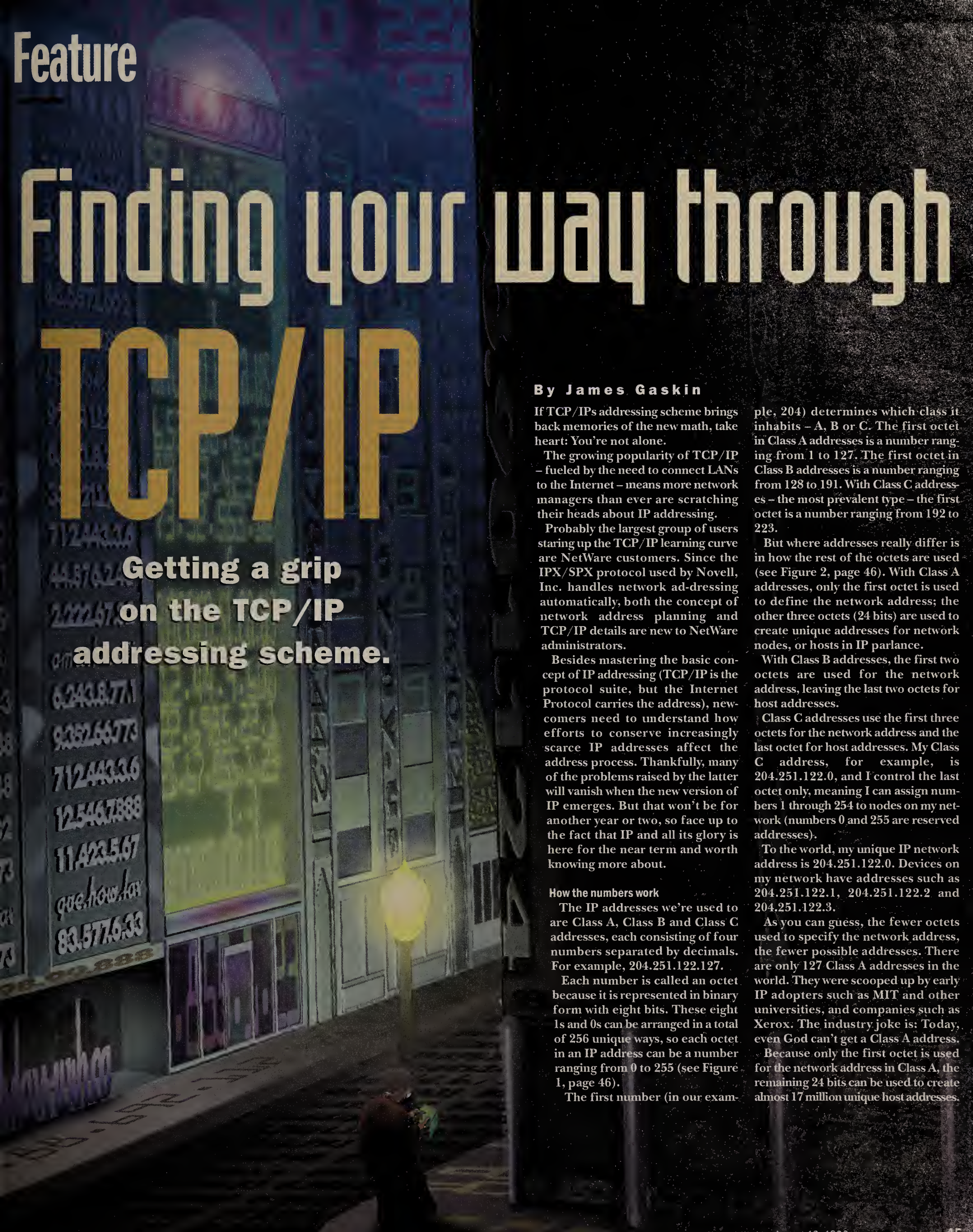


Finding your way through TCP/IP

Getting a grip on the TCP/IP addressing scheme.

By James Gaskin

If TCP/IPs addressing scheme brings back memories of the new math, take heart: You're not alone.

The growing popularity of TCP/IP – fueled by the need to connect LANs to the Internet – means more network managers than ever are scratching their heads about IP addressing.

Probably the largest group of users staring up the TCP/IP learning curve are NetWare customers. Since the IPX/SPX protocol used by Novell, Inc. handles network ad-dressing automatically, both the concept of network address planning and TCP/IP details are new to NetWare administrators.

Besides mastering the basic concept of IP addressing (TCP/IP is the protocol suite, but the Internet Protocol carries the address), newcomers need to understand how efforts to conserve increasingly scarce IP addresses affect the address process. Thankfully, many of the problems raised by the latter will vanish when the new version of IP emerges. But that won't be for another year or two, so face up to the fact that IP and all its glory is here for the near term and worth knowing more about.

How the numbers work

The IP addresses we're used to are Class A, Class B and Class C addresses, each consisting of four numbers separated by decimals. For example, 204.251.122.127.

Each number is called an octet because it is represented in binary form with eight bits. These eight 1s and 0s can be arranged in a total of 256 unique ways, so each octet in an IP address can be a number ranging from 0 to 255 (see Figure 1, page 46).

The first number (in our example, 204) determines which class it inhabits – A, B or C. The first octet in Class A addresses is a number ranging from 1 to 127. The first octet in Class B addresses is a number ranging from 128 to 191. With Class C addresses – the most prevalent type – the first octet is a number ranging from 192 to 223.

But where addresses really differ is in how the rest of the octets are used (see Figure 2, page 46). With Class A addresses, only the first octet is used to define the network address; the other three octets (24 bits) are used to create unique addresses for network nodes, or hosts in IP parlance.

With Class B addresses, the first two octets are used for the network address, leaving the last two octets for host addresses.

Class C addresses use the first three octets for the network address and the last octet for host addresses. My Class C address, for example, is 204.251.122.0, and I control the last octet only, meaning I can assign numbers 1 through 254 to nodes on my network (numbers 0 and 255 are reserved addresses).

To the world, my unique IP network address is 204.251.122.0. Devices on my network have addresses such as 204.251.122.1, 204.251.122.2 and 204.251.122.3.

As you can guess, the fewer octets used to specify the network address, the fewer possible addresses. There are only 127 Class A addresses in the world. They were scooped up by early IP adopters such as MIT and other universities, and companies such as Xerox. The industry joke is: Today, even God can't get a Class A address.

Because only the first octet is used for the network address in Class A, the remaining 24 bits can be used to create almost 17 million unique host addresses.

ILLUSTRATION BY ERIC BERENDT

There are more than 65,000 Class B addresses, each of which supports 65,534 unique 16-bit host addresses. As such, they are reserved for companies and institutions with a minimum of 4,000 hosts and which can demonstrate a need for at least 32 subnets. Although there are still some Class B addresses left, they are increasingly rare and hard to obtain.

Three octets (24 bits) are used to specify network addresses in Class C, resulting in nearly 17 million network address combinations, each of which can support 254 IP addressable nodes. Class C users accommodate network growth by applying for more Class C addresses or by using a Class A or Class B scheme within the network and a translation device for communicating with the outside world.

Segmenting IP networks

Regardless of class, traffic growth will ultimately make it necessary to segment the network to reduce packet congestion on the wire. Much of the confusion about IP addressing involves segmenting, which is achieved using something called a subnet mask. Although segmenting with subnet masks is more straightforward in Class A and Class B, both of which offer enough address flexibility for companies to do what they want, it gets a bit thorny with limited Class C addresses. Segmenting results in more total networks but fewer nodes per network because subnet masks reduce the number of bits left to define host addresses (see Figure 3, this page).

Splitting a Class C address into two subnetworks, for example, steals two bits from the last octet and adds them to the bits used for network addressing. With only six bits left to define host addresses, each of the two networks can only support 62 unique addresses (actually it is 64, but two are unusable).

FIGURE 1: The octet connection

Each number in an IP address is called an octet because it is represented in binary form with eight bits. These eight 1s and 0s can be arranged in a total of 256 unique ways, so each octet in an IP address can be a number ranging from 0 to 255.

What you see:

204.251.122.127

Your network sees:

11001100.11111011.01111010.01111111

Large nets mean large problems

Problems with IP addressing often add up to routing problems. The more convoluted the addressing schemes get, the more overloaded the routing tables become. When routers must examine complicated tables full of exceptions, performance gets bogged down.

North Carolina State University's IP network supports some 15,000 clients and more than 1,000 IP subnets, and the thing network engineer Phil Emer worries about most is routing heavy traffic quickly. "We have seven or eight ATM switches with about 100 ATM ports, and I can't have routers with five or six subnets per physical interface slow down the network," he says.

North Carolina State University's *Emer*

To ease the strain, Emer is considering renumbering his IP network from the ground up to do away with some of the subnets. While drastic, renumbering is often the easiest way to get control of a network that's grown in surprising areas, ruining the early network design.

Renumbering is like organizing your closet. You can keep stuffing things in and try to make do by shuffling things around, but it is often better to pull everything out onto the floor, sort through it and start over.

Brian Dindial is product manager for backbone protocols at Bay Networks, Inc., which often has to help customers organize their networks. "We almost always tell them to bite the bullet and renumber," Dindial says, "but they rarely do it."

Since so few Class B network numbers are still available for large companies, renumbering often means using an Internet network address that is not unique. This "illegal" address would cause routing havoc if connected directly to the Internet, so address translation must be used. Keeping your internal network address hidden from the Internet also improves network security since outsiders don't know the real address of any internal systems.

The Internet Assigned Numbers Authority has reserved the following three blocks of the IP address space for private networks:

- 1 Class A network number: 10.0.0.0 to 10.255.255.255.
- 16 contiguous Class B numbers: 172.16.0.0 through 172.31.255.255.
- 255 contiguous Class C numbers: 192.168.0.0 through 192.168.255.255.

Any company may use these numbers, but they must use products such as Network Translations, Inc.'s (now a division of Cisco Systems, Inc.) Private Internet eXchange to translate concealed local addresses into legitimate IP addresses for Internet connection.

The real address seen by the Internet at large may be only a small portion of a Class C address using Classless Inter-Domain Routing assigned by an Internet service provider. Hundreds or thousands of companies around the world may all use the Net 10 Class A address internally, using address translation to a unique IP address for Internet connections.

—James Gaskin

Splitting a Class C network into six subnets requires stealing three bits from the last octet and limits the number of nodes per network to a maximum of 30. You can divide a Class C network into more subnets, but the usable address space would be too small to be useful.

The universal subnet mask number used to segment a Class C network into two nets is 255.255.255.192, whereas the subnet mask used to segment a network into six nets is 255.255.255.224. These numbers are simply put into the TCP/IP configuration software for each device to be networked. Think of Class A as /8, Class B as /16, and Class C as /24. These designations specify how many network address bits each has, which obviates than relying on the traditional subnet mask for that information.

A Class C network 204.251.122.0 with a subnet mask of 255.255.255.224 can be written 204.251.122.0/27 instead. This indicates we want to use 27 of the 32 total address bits to define the network address, leaving the rest of the address space to define host addresses.

CIDR and VLSM

Why bother with masking instead of simply getting a Class B address? As noted, you need 4,000 or more nodes to even qualify for a Class B address, and even if you fit the bill, you still might not be able to get one because they are scarce.

How can that be, given there are almost 4.3 billion possible addresses with the current version of IP? The reason is that they are not used very efficiently. Institutions with Class A addresses that can support nearly 17 million host addresses end up wasting millions of them. The same is true with Class B users and even small Class C shops. My Class C address allows 254 hosts, but I only have 10 systems in my lab.

> *Institutions with Class A addresses that can support nearly 17 million host addresses end up wasting millions of them. The same is true with Class B users and even small Class C shops.*

Estimates are that only 5% of all assigned IP addresses are actually being used, primarily due to this waste.

FIGURE 3: Unmasking subnet masks

Segmenting IP networks requires use of subnet masks. Segmenting a Class C address, for example, involves stealing bits from the last octet for network addressing.

Segmenting a Class C address into two networks steals two bits, leaving six bits for host addresses.

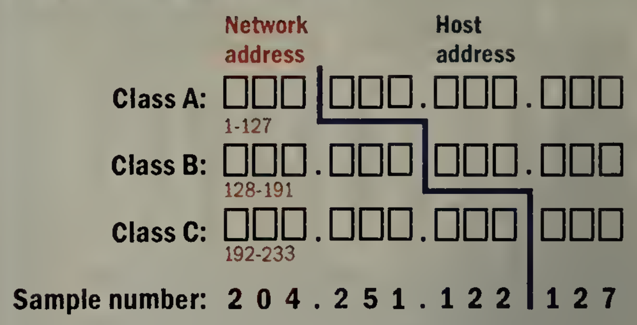
Network address	Host address
11001100.11111011.01111010.01	111111

Segmenting a Class C address into six subnets steals three bits, leaving only five for host addresses.

Network address	Host address
11001100.11111011.01111010.011	11111

To help conserve addresses, the industry has adopted a few tricks, one being Classless Inter-Domain Routing (CIDR).

FIGURE 2: How addresses differ



With Class A addresses, only the first octet is used to define the network address, and the other three are used to create unique host addresses. With Class C addresses, the opposite is true.

Let's say an Internet service provider has 32 Class C network addresses assigned by the Internet Network Information Center, or a total of 8,192 addresses. Using CIDR, these 32 networks can be grouped and addresses from this pool allocated more efficiently among different companies.

Instead of assigning 254-node networks to each customer, CIDR allows ISPs to allocate addresses in powers of two, meaning networks can be assigned with 32, 64, 128, 256, 512, 1,024, 2,048 or 4,096 host addresses.

Said another way, CIDR would enable this ISP to support 256 networks of less than 32 nodes, where strict Class C addressing would allow only 32 networks. A company with an IP-based network and a similar number of Class C addresses could use CIDR in much the same way.

The industry is also turning to something called Variable Length Subnet Masks (VLSM) in an effort to conserve numbers. VLSM works much the same way as CIDR, but with existing IP network addresses. You can add a second subnet mask to your network addresses by using an extended-network prefix.

Unfortunately, there's no free lunch: If your host software doesn't support CIDR or VLSM, the flexibility they provide will do you little good.

Next-generation IP

Adding more IP addresses is half of the advantage of IPv6, the planned revision of the current IP, Version 4 (IPv4). IPv6 will use 128 bits of address space, rather than the 32 bits used by IPv4.

Even if we allocate IPv6 addresses as inefficiently as we have IPv4, there will soon be over 1,500 IP addresses for every square meter of dry land on Earth, according to *Routing in the Internet*, a Prentice Hall book by Christian Huitema.

The other advantage of IPv6 is that address configuration time will drop to nearly zero because it mimics Novell's IPX automatic address configuration.

There is one big difference between IPX and IPv6. Instead of broadcasting their location as they do with IPX, stations will get addressing information from IPv6

Management Strategies

Covering: Career Insights and Innovations
in Managing Staff, Budgets and Technology

Briefs

■ **NetSolve, Inc.** *this week will introduce its* **ProWatch Secure** *outtasking service.*

Under ProWatch Secure, NetSolve will help users develop a 'Net security policy that defines the type of incoming and outgoing traffic that will be permitted. For instance, users can allow incoming or outgoing HTTP or File Transfer Protocol (FTP) traffic, but not telnet traffic.

A Wheel Corp. NetRanger intrusion detection device and Internet firewall is installed at the customer site. NetRanger monitors traffic looking for patterns (also called signature events) that indicate someone is trying to break the security policy. Once an attempt is detected, an alert is sent to NetSolve's network operations center.

The service implementation fee is $5,000, with Net Ranger costing $13,750 to $24,860. The monthly fee is priced at $895 for a 36 months.

NetSolve: (512) 795-3000.

Rip up that paperwork

Don't bury users in paperwork when senior management asks you for reports justifying support costs.

By Douglas Welch

Anyone who has sought or supplied network support has stories to tell about paperwork. While users may blame the network staff for their troubles on this front, it is often upper management that causes the extra work.

In these days of downsizing and insecurity, network managers are often forced to justify every single action, be it a personnel decision or the purchase of new equipment. This often means collecting hard data to show exactly what tasks the network staff is performing or why the purchase was justified.

While collecting such data in itself is not wrong, it often becomes more important to fill out the paperwork and create status reports than it is to actually solve a problem and get users back to work.

Sure, some of the forms are good and ensure that accounts are created properly, equipment is configured and maintained correctly, and productivity is enhanced. Examples include a well-designed new user form that collects all the necessary information in one succinct piece of paper, or regularly updated maintenance and configuration logs that help the network staff track changes and additions to the network.

But often the forms create paperwork that fails to have any redeeming value. This includes poorly designed forms that are difficult to fill out or require numerous approval signatures, written requests to get action on a typical support call and lengthy justification forms for equipment purchases.

New equipment justification forms can sometimes turn into cruel and unusual punishment. Unable or unwilling to make the justification to upper management, network groups push the onerous task onto their users. Unfortunately, users lack the knowledge or expertise to make the most persuasive written argument for new equipment. This lack of support from the network group is often taken by management as proof that the new equipment was unnecessary, making the justification an exercise in futility.

There are ways to ensure that the network group has the information it needs to provide good service and track its productivity without adversely affecting the productivity of its users. Most of the actions you can take will eliminate paperwork or at least automate it (see graphic).

You should question the value of every existing form and eliminate the ones that don't help users become more productive. Remember, the network was created to allow employees to work effectively and generate income, not paperwork.

Welch is a computer consultant and freelance writer in Van Nuys, Calif. He can be reached at dewelch@earthlink.net.

Paperwork reduction

Here are some ways to put paper out of work:

- Collect as much data as possible from a user at first contact. This should include user contact information, PC configuration, network patch number and other hardware information. The goal is to never ask the user for the same information twice.
- Install and use a support tracking system that not only provides a database for the information gathered in the step above, but also produces statistics and status reports automatically, thus freeing the network staff from manually generating these reports each week.
- Review any paperwork currently being generated. If any form does not ultimately enhance user productivity, stop using it. Don't force users to fill out forms just so you can track your own department's productivity.
- Triage support calls by phone immediately. There is no need to tell someone calling for support to hang up and submit a request for help on paper even if the request is for routine and non-emergency support. Requirements for a written request should be limited to mid- and long-term projects or long-term support problems such as bug work-arounds for software.
- Don't use the need to process paperwork as a way to put off dealing with requests to perform certain tasks. This only delays the inevitable and reduces user productivity. Instead, realistically prioritize requests as they come in and add them to your work list right away.

CONFERENCE PLANNING

CONFERENCE: Seybold San Francisco
WHEN: Sept. 9-13
WHERE: Moscone Center, San Francisco
SPONSOR: Seybold Seminars
CONTACT: (800) 488-2883

Geared to Internet, publishing and graphics professionals, the conference will focus on the convergence of print and online publishing, examine technology advances and peek at what the future holds. Internet-conscious attendees can participate in Internet@Seybold.SF, a week-long series of seminars on Internet publishing.

In addition, six New Tech Labs on the show floor will extend the educational program of conference sessions, seminars and courses by offering hands-on exposure to practical applications and workflow technology. The MetaTools Digital Theater and the Apple Computer Internet Showcase will feature Internet and intranet publishing applications and interactive multimedia demos.

With special discount packages, registration fees range from $999 to $2,199. The three-day conference alone costs $999. Individual seminars and full-day courses cost $399 to $699. A variety of half-day courses cost $199 to $849.

More information about these conferences can be found on Network World Fusion http://www.nwfusion.com. Select Careers, then Conference Planning.

• • •

CONFERENCE: Network World Unplugged
WHEN: Sept. 9-13
WHERE: Boston
SPONSOR: DCI
CONTACT: (508) 470-3880

This year's conference has four tracks. Extending the Enterprise: Bringing Corporate Networks to New Locations will explore remote branch-office connection issues such as information policy, security, frame relay and ATM. Working on the Web: Internet and Intranet Strategies will examine the Internet as a remote connection alternative to dial-up and how Internet tools can be used for distributing information in-house. Mobile Solutions will examine the challenges, technologies and standards surrounding the mobile worker. And Issues & Answers: The Latest Technologies will feature a series of debates by remote-access industry experts and vendors.

Four- and five-day conference packages cost $1,295 and $1,495, respectively. Cost for the three-day conference only is $995.

• • •

CONFERENCE: Computer Training & Support Conference & Expo
WHEN: Sept. 7-13
WHERE: Nashville
SPONSOR: Softbank Institute
CONTACT: (800) 348-7246

This conference targets those who develop, deliver or manage training and support. Conference sessions will focus on how to offer these services across varied platforms, deal with Windows NT, interface with the Internet, and evaluate upgrades and product previews. In addition, special case study sessions will present real-life solutions to training challenges.

Six buyer's guide sessions can help with product and service evaluations. Attendees can also take the new Certified Technical Trainer Exam or software-specific exams from Microsoft Corp., Novell, Inc. and Lotus Development Corp. Pre- and postconference seminars will cover management planning and staff burnout, interactive technologies and professional development.

The full conference and expo costs $995. A one-day preconference seminar costs $225. A two-day postconference seminar costs $695.

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Network Engineer

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Program Manager

You'll write specifications for all radius and SNMP feature changes; working with the accounts and authorization teams to understand the role, use, and limitations of radius. You'll utilize management skills as you work with Microsoft Network (MSN) Services development and test teams to allocate resources; planning, scheduling, and reporting goals, delivery dates, progress and risk factors for all future development; and reviewing all bug reports and inquiries from access partners. You'll need at least 5 years computer networking or information systems experience and proven ability in TCP/IP networking, program management, client/server architectures and telecommunications. Knowledge of Windows95 dial up networking a plus. A BA/BS or MA/MS degree in Computer Science or Information Systems preferred.

Network Engineer

Use you knowledge of Wide Area Networks to lead technical problem-solving discussions, help reach common engineering and scheduling goals and develop router software configuration tables. You'll work closely with Architecture and Planning teams and will be responsible for maintaining network standards, specifications, documentation and test plans; and conducting test of new network hardware/software. Qualifications? At least 5 years of wide area network design and engineering experience required. You should also have proven knowledge of TCP/IP protocol stack, frame relay, PPP, ISDN and T-carrier transmission technology. BA/BS degree in Electrical Engineering or Computer Science and familiarity with MS Word, Excel and Access desired.

Network Engineer

Perform network installation, test and documentation for Wide Area Networks using routed connections to partner networks and the Internet. You'll provide physical space and power planning, coordinate carrier provisioning, maintain project schedules and develop router interface and software tables from engineering plans. What's it take? You'll need at least 5 years of network experience with proven knowledge of TCP/IP, frame relay, T-carrier transmission, OSPF and routing protocols. You must be skilled in router, terminal server and CSU/DSU and physical interface standards. Strong routing protocols, router configuration, and conducting acceptance testing from physical to network layers a plus.

Network Engineer

Use your expertise with networks to integrate network management systems, write scripts to collect performance information and implement and operate support for new tools. You'll develop maps of key network components, maintain configuration documents and manage and implement changes as new element management systems evolve. What's it take? Proven knowledge of IP, PPP, frame relay, X.25, SNMP, SONET and ATM protocols. Experience with packet sniffers, router configuration and digital transmission systems. Familiarity with related protocols, MS Office applications and the Internet. A BA/BS in Computer Science or Electrical Engineering preferred.

Email your resume in ASCII text format to resume@microsoft.com (indicate Dept. Ad8b9-0819 in the subject header). Or mail to: MICROSOFT CORPORATION, Attn: Recruiting, Dept. Ad8b9-0819, One Microsoft Way, STE 303, Redmond, WA 98052-8303. For additional information, look to http://www.microsoft.com/jobs/. No phone calls please. We are an equal opportunity employer and support workforce diversity.

Microsoft®

Feature

Continued from page 46

routers, which send multicast packets containing address configuration details. If a new station doesn't hear the information in time, it can send a multicast packet of its own requesting address information. The manual configuration of IP addresses required with IPv4 will simply evaporate.

Robert Hinden, director of software at Ipsilon Networks, Inc. and co-chair of the IPNG Working Group that formulated the standards for IPv6, says, "Many of the options in IPv4, such as multicast support and security, are standard in IPv6. Vendor testing will guarantee these features interoperate, which is not the case with IPv4."

At least 10 TCP/IP vendors have IPv6 protocol stacks in development. The current Internet drafts are available at http://www.ietf.org/1id-abstracts.html. Over a dozen drafts address some portion of IPv6 development.

Brian Dindial, product manager for backbone protocols at Bay Networks, Inc., is optimistic about IPv6. "The packet standards are set," says Dindial, "but the routing standards are only available in draft mode today." Bay has pledged to support IPv6 as quickly as possible, and is involved in IPv6 interoperability testing already.

Peter Long, manager of product marketing for Cisco Systems, Inc.'s Cisco Internet Operating System, promised IPv6 compliance as soon as the routing standards are settled.

> *"Build your IPv4 network today, knowing that the next major release of software in 1997 will include IPv6 code. In two years, your network may be all IPv6 without renumbering."*

Until then, we will have to rely on better IP address management to stretch the available addresses.

That is easier said than done. Phillip Emer, a network engineer at North Carolina State University, says, "We don't have the luxury of time. IPv6 will take two years to gain real momentum. I have to build an ATM network now."

Hinden sympathizes with Emer and says, "Build your IPv4 network today, knowing that the next major release of software in 1997 from all your TCP/IP vendors will include IPv6 code. In two years, your network may be all IPv6 without renumbering."

Gaskin is a Dallas-area network consultant, columnist, and author of books about NetWare and the Internet, including NetWare to Internet Gateways *from Prentice Hall.*

Gaskin can be reached at james@gaskin.com.

ON LINE

Still thirsty for more information? There are some good free papers available, notably a 3Com white paper titled, "Understanding IP Addressing: Everything You Ever Wanted to Know," by Chuck Semeria.

http://www.nwfusion.com

Message queue

Continued from page 41

In addition, Cisco offers several standards-compliant options, allowing users to select the level of function they need without sacrificing interoperability.

Donna Kidder
Data Link Switching product manager
Cisco Systems, Inc.
InterWorks Business Unit
Research Triangle Park, N.C.

Wickre responds: My column was written from the perspective of carrier dominance of the frame relay marketplace. In its popular adoption, frame relay is, in fact, a public carrier service. The piece was not written to review Cisco's product line. Rather, the column had three main points:

First, in any of its forms, DLSw creates more overhead than RFC 1490, requiring the user to purchase more bandwidth. The primary justification for private-line conversion to frame relay is to reduce users' telephone company expenses. Vendor customer premises equipment (CPE) that is less efficient than the Frame Relay Forum's ratified standard acts in a contrary fashion to users' expectations.

Second, host-centric transaction processing systems using SNA networks are hierarchical and have static, fixed network paths. Complex link-state algorithms are not a requirement for star network configurations. Therefore, the complexity of routers is not needed.

Third, during frame relay's continued emergence and growth, carriers are providing or planning new value-added services.

Increasingly, we see Network-to-Network Interface gateways being used to interconnect a variety of carriers. Proprietary CPE may raise unforeseen technical issues.

As Kidder points out, LLC2 transport has not yet been standardized. If only one company advocates a protocol (DLSw Lite), it is proprietary.

I stand by my conclusion. For mainframe-based processing where the majority of traffic will remain SNA, standards-based RFC 1490 is the only way to go.

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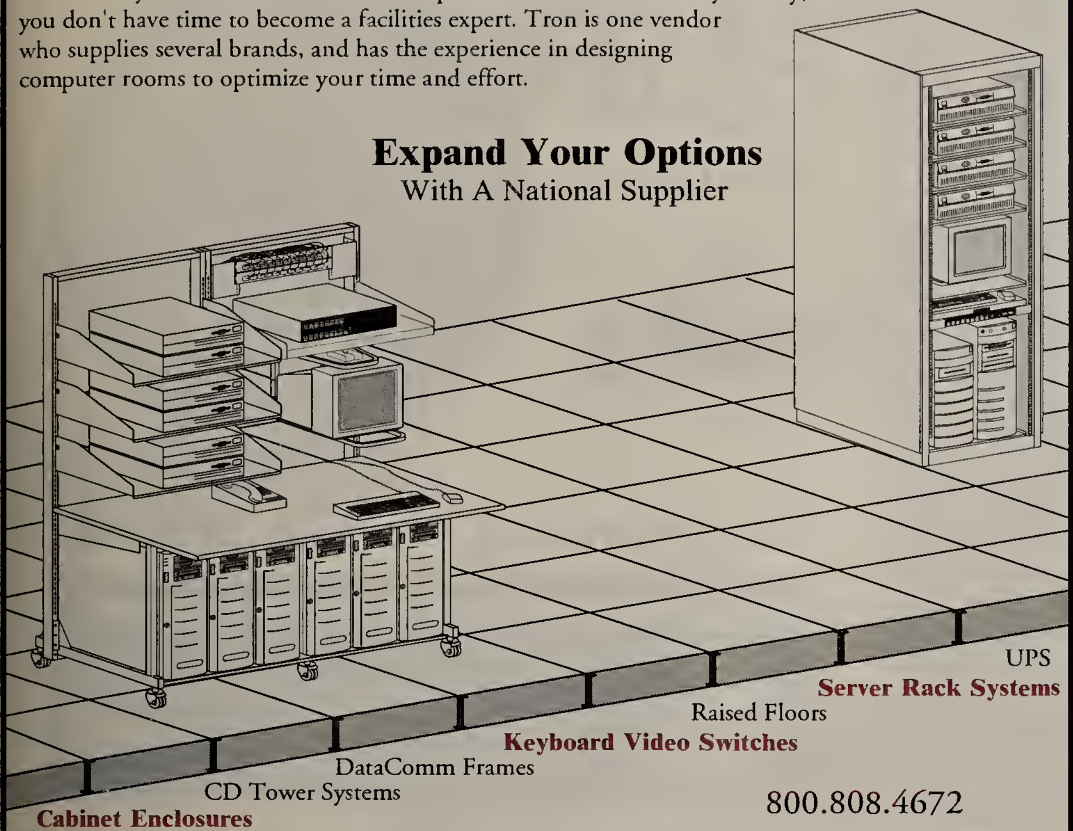

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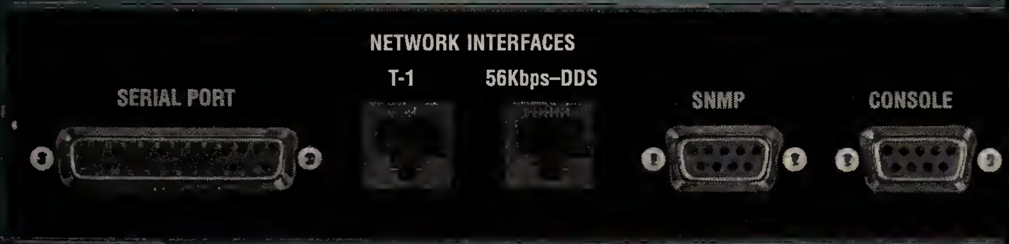

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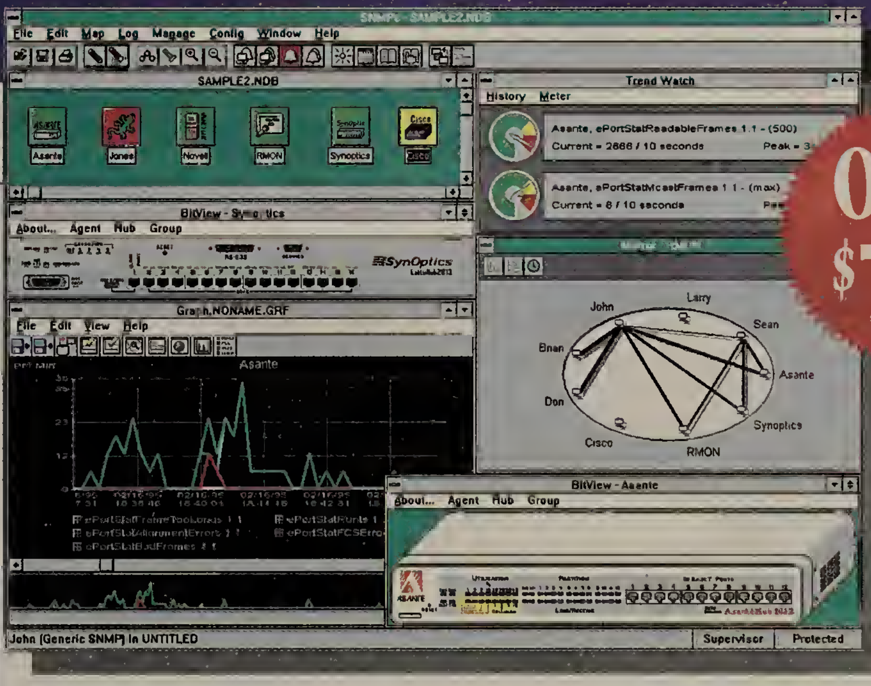

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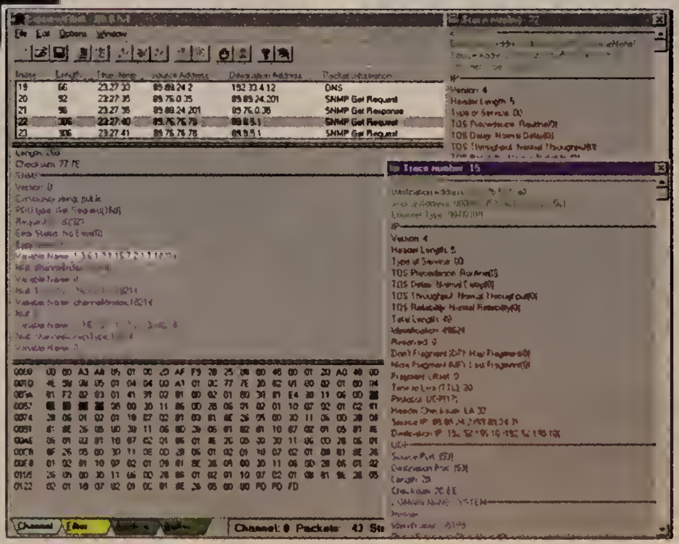

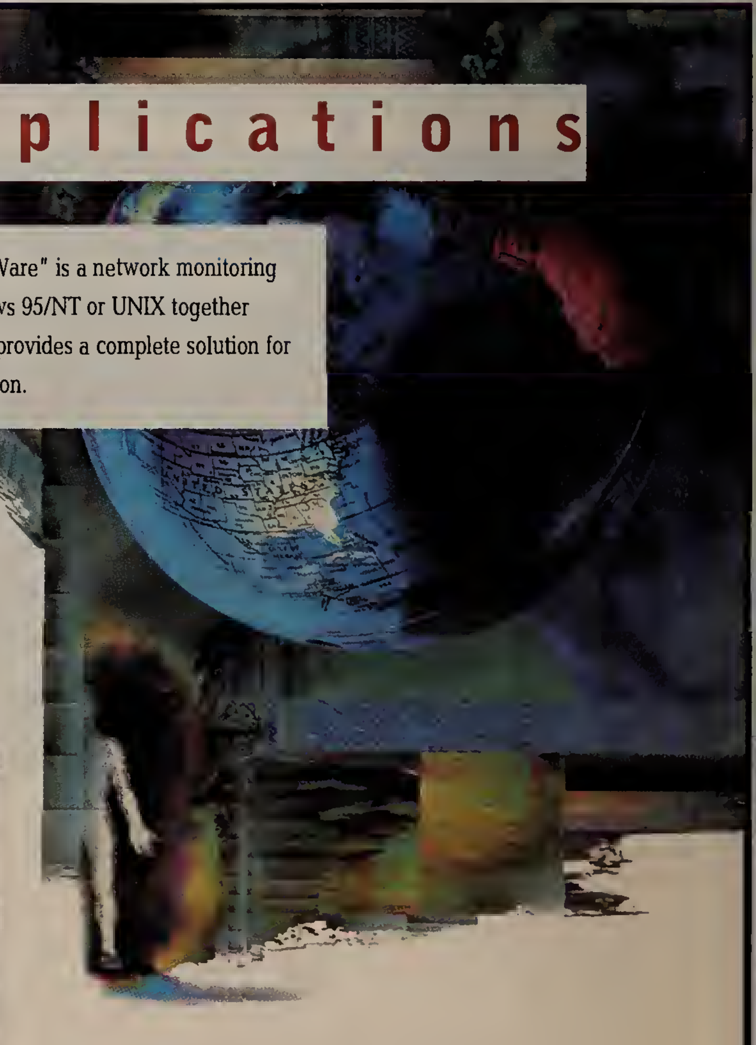

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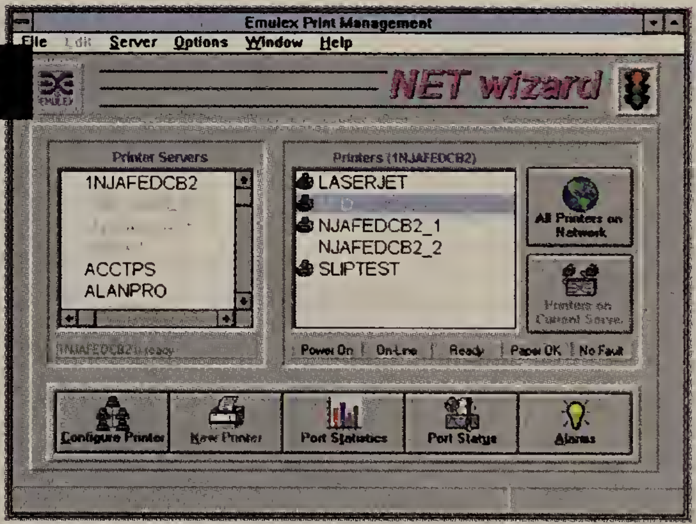

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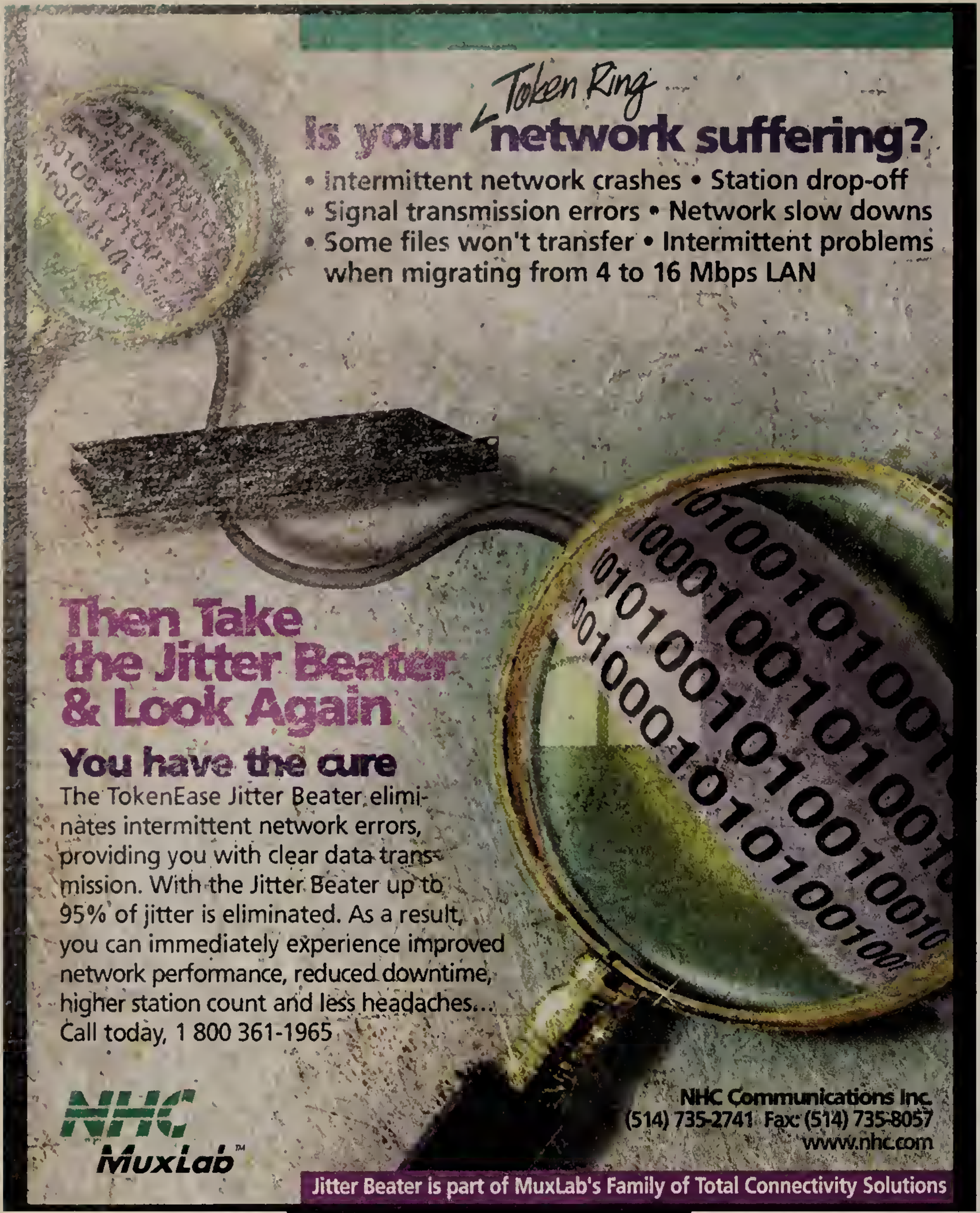

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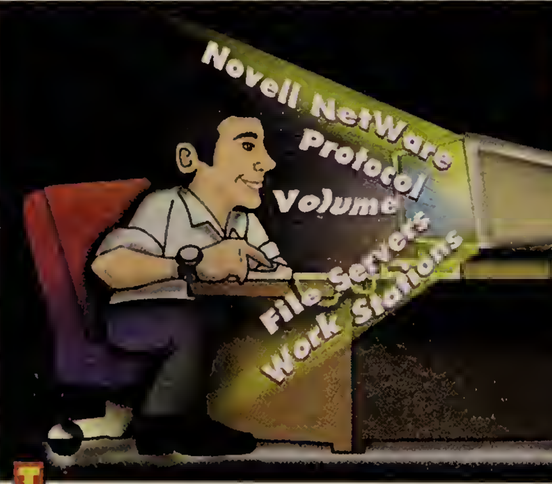

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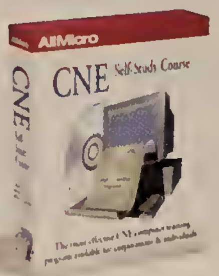

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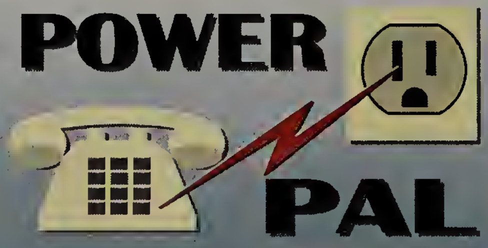

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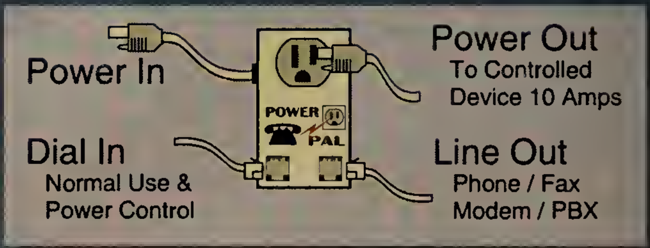

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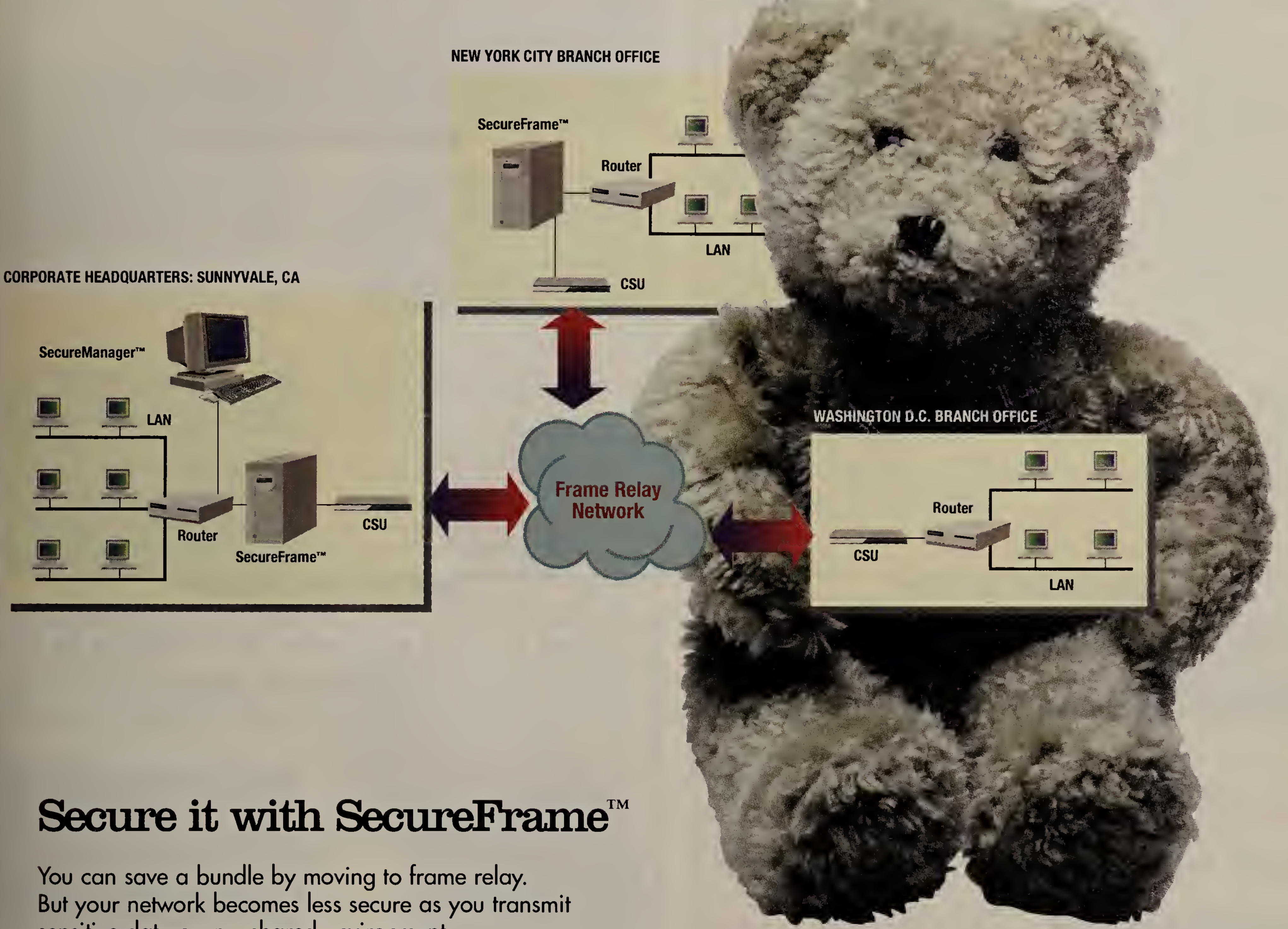
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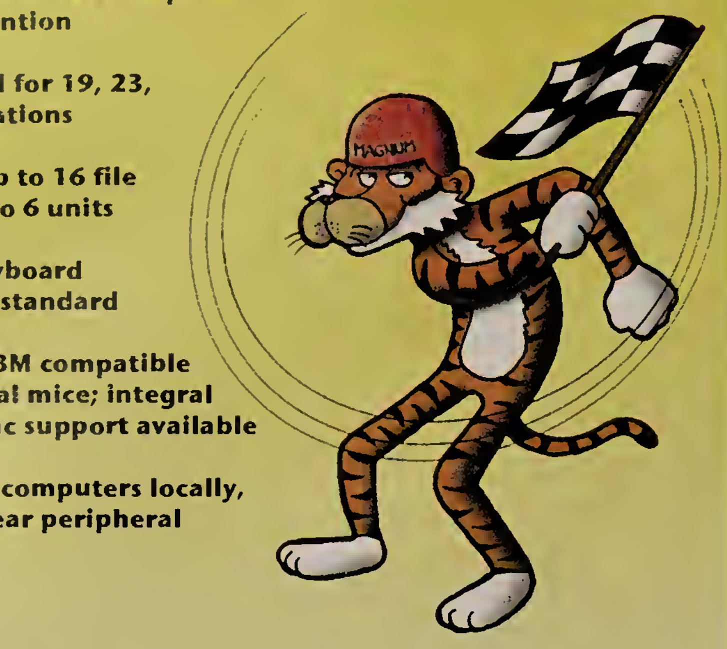

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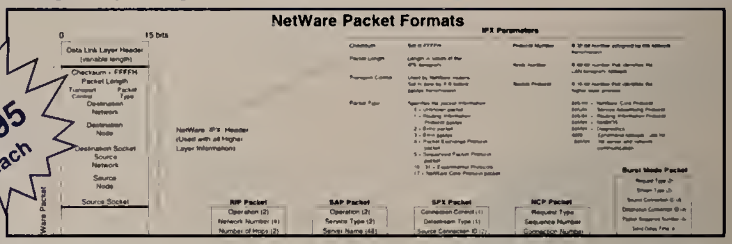

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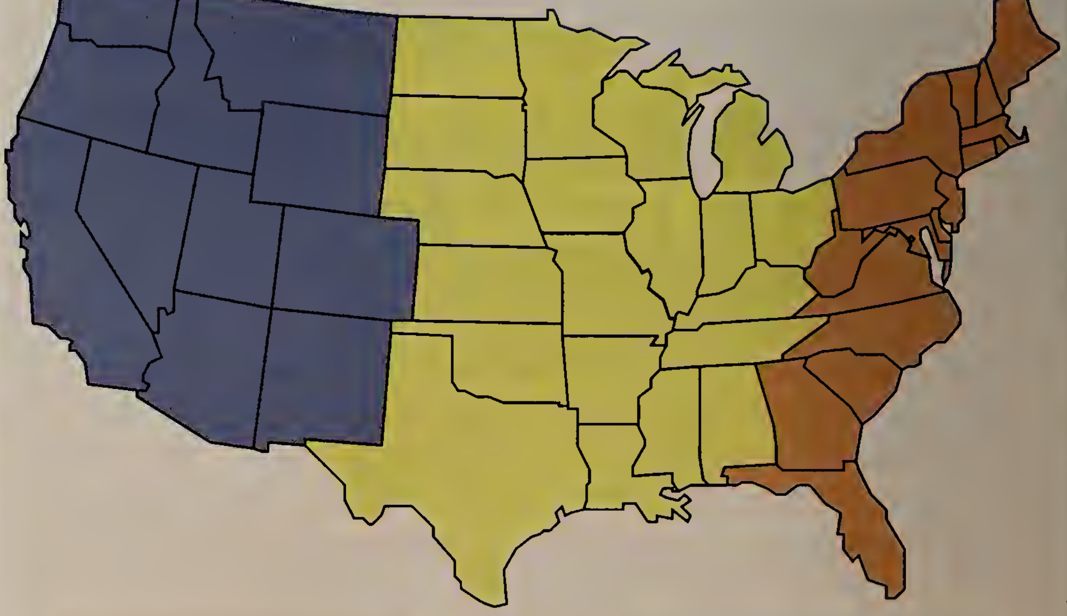

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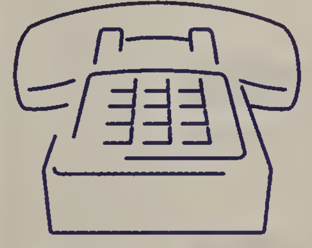

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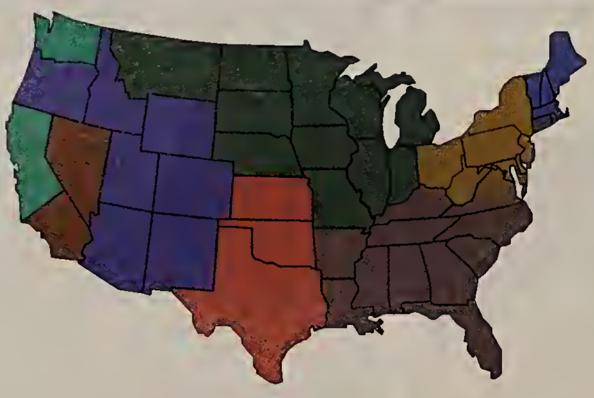

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EDITORIAL INDEX

3Com ... 1
A
ACC ... 1
Acclaim ... 25
Allaire ... 9
Alteon ... 1
America Online ... 62
Ameritech ... 6,61
Apple ... 28
Ascom Timeplex ... 1
AST ... 42
AT&T ... 6,22,40
AT&T Wireless Properties ... 22
Avantel ... 12
B
Bay ... 1,6,16
BEA ... 31
C
Cable & Wireless ... 23
Cabletron ... 1
Cisco ... 1,6,7,27
Cognisoft ... 25
Compaq ... 42
Computer Associates ... 1
Concord ... 16
Cubix ... 25
D
DataRace ... 16
Digital ... 42
E
Erol ... 23
F
Fore ... 27
G
Ganymede Software ... 16
Granite ... 1
GTE ... 6
H
HP ... 16
I
IBM ... 9
Inacom ... 40
Information Dynamics ... 35
INS ... 6
Intel ... 23,25
Internet Security Systems ... 8
L
Lotus ... 47
M
MCI ... 22
MFS ... 22,61
Micom ... 1
Microsoft ... 6,13,25,28,31,34,47
N
National Registry ... 35
NBase ... 1
NCR ... 25
Netscape ... 6,9,13,34
NetSolve ... 47
Network General ... 16
Newbridge ... 28
Novell ... 1,25,47
NSI ... 12
O
Oracle ... 1,6
OST ... 28
P
PacBell ... 23,61
Packet Engines ... 1
ParcPlace-Digitalk ... 9
Platinum ... 6
Prominet ... 1
S
Sagent ... 31
Sahara ... 7
SAP ... 6
Sapphire ... 25
SAS ... 31
SBC ... 22
Shiva ... 16
Sprint ... 22,61
Sterling Software ... 16
Sun ... 35
SunSoft ... 9
Sybase ... 31
T
Telmex ... 22
Tierra ... 12
Transarc ... 31
U
UUNET ... 22
V
Vasco Data Security ... 35
VeriSign ... 31
W
Wildfire ... 6
X
XDB ... 31

ADVERTISER INDEX

Advertiser	Reader Service#	Page#
3Com Corp	35	10,11
AMP Inc	26	20,21
Ascend Communications		2,3
Cascade Communications	27	17
ChatCom Inc	32	26
Compaq Computer Corp		19,23,27,32,33
DCI/NWW Unplugged		44
D-Link Systems Inc	1	29
Hewlett Packard		4
IBM		7,9,63
Lucent Technologies		14,15
Memotec Communications	28	18
NetManage Inc	33	13
NORTEL	29	64
QMS Inc	30	34

Regional/Demographic

Ads appear in selected issues.

NBase	34	39
Pacific Bell		38,39
Swiss Telecom	31	24

Marketplace	Reader Service#	Page#
Allmicro Inc	249	54
Ascom Timeplex	311	52
Castle Rock Computing	252	51
Cybex Computer Products Corp	227	56
Cylink Corporation	250	55
Dataprobe	285	54
Eastern Research Inc	225	51
James River Group		52
NHC Communications Inc	281	54
Rave Computer Association	302	54
TODD Enterprises	247	56
Technically Elite	247	52
Tron International	233	51
West Hills LAN Systems	297	57

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NSF

Continued from page 1

worth in the Internet," said Mark Luker, program director for NSFNET.

The goal, he added, is not to conduct separate research from the commercial Internet community, but to provide the environment to expedite development of needed technologies.

"We expect this will lead to a blossoming of research," Luker said. The program is expected to spawn applications such as high-performance collaborative computing using video simulations, distributed computing of hundreds of workstations with massive data sets and remote control of sensitive scientific instruments.

In addition, Luker said, vBNS will employ Internet technologies such as Resource ReserVation Protocol (RSVP) and IP Version 6 as they become available. NSF's hope is that Internet service providers, equipment vendors and others will test their implementations on vBNS to ensure interoperability before those products and services make their way to market.

Getting faster

A 155M bit/sec OC-3 network, vBNS was launched in April 1995 to foster research into high-speed networked applications. MCI Telecommunications Corp. manages it for the NSF. The NSF said it will upgrade vBNS to OC-12 rates by year-end, and within five years, it hopes to take advantage of the 2.2G bit/sec transmission speeds currently available on MCI's national Synchronous Optical Network (SONET).

Initially, use of vBNS was restricted to five national supercomputing centers, largely to ensure those sites would have ample bandwidth for research. That arrangement will radically change with the first wave of new research grants.

In addition to expanding the vBNS bandwidth, the NSF said it will carve out a virtual private network and dedicate it to the supercomputing centers.

"The people doing bleeding-edge net research try to break experimental protocols over the net, and that conflicts with the desire of the supercomputing sites to have a stable network environment," Luker said. "We can allow both to coexist."

Opening up vBNS to the research community also will placate scientists and other members of the research community who have become increasingly dismayed with the performance and the reliability of the Internet since the NSFNET backbone was decommissioned in April 1995.

This past April, researchers from several renowned research centers fired off a letter to the Federal Networking Council, complaining about "catatonic" Internet connections and labeling the Internet's state as "disastrous."

"We believe this will have an immediate impact on those that were affected," Luker said.

Some researchers said that problems still abound. Tim Kuhfuss, director of Argonne National Laboratory's Electronics and Computing Technologies division, said he still hears complaints from education partners about "file throughput and common usage issues."

Steve Corbato, manager of the network engineering group at the University of Washington, is among those who have run into snags.

"We may not have a high bandwidth requirement, but we do real-time observing and still we've encountered reliability problems over the Internet," Corbato said. While the university is vying for a spot on vBNS, he said it would not abandon its commercial Internet links.

Where the NSF can help, he said, is in coordinating development of bandwidth reservation protocols such as the emerging RSVP protocol. Having checked with ISPs, Corbato is not convinced they are all on the same page. "Some are hedging," with regard to how they will coordinate bandwidth reservation handoffs with other ISPs, he said. "They haven't reached that level of detail yet. They're too busy fighting bandwidth fires."

Good first step

The new NSF program rings similar to an idea a number of researchers pitched last year. Officials from Argonne Labs, the University of Illinois and others floated a plan for an I-way, or high-speed research backbone, that would link major research institutions with each other and share resources with government institutions such as NASA, the Defense Advanced Research Projects Agency, the Department of Energy and prominent international sites.

The current plan is for those sites to hook up with vBNS, but it falls short of the full resource sharing that the I-way project sought. "It's a good first step," Argonne's Kuhfuss said. ■

IT AIN'T CHEAP

It costs $460,000 over a two-year period to hook into the OC-3 ATM port on the vBNS network, according to Earving Blythe, vice president of information systems at Virginia Tech. The OC-3 drop for the local loop costs $150,000 a year, he said.

Get more info on Network World Fusion, including:
- **A detailed description of vBNS**
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NAP subsidies dry up

Success carries a heavy price.

A quartet of Internet exchange providers last week learned that the price of success is about $640,000 each.

That's the amount of funding the National Science Foundation rescinded from Ameritech Corp., Metropolitan Fiber Systems, Inc., Pacific Bell and Sprint Corp. — all of which operate NFS-sponsored network access points (NAP) on the Internet.

NAPs are exchange points that various Internet service providers hook into so they may pass traffic destined for each others' networks. NSF officials decided after a recent panel review that the NAPs are now financially stable, and there is adequate demand for their services. Moreover, a number of other exchanges have established services, and the NFS cannot afford to subsidize all of their operations, said Mark Luker, NSF's program manager for NSFNET.

Each of the NAPs may be available for NSF funding if they focus research on advanced networking issues related to routing at NAP sites, he said.

— *Charles Bruno*

CA

Continued from page 1

While some large companies such as Oracle Corp. have significant consulting and systems integration efforts, creating a separate Internet services division is unusual.

CA, which is already quietly working with customers, is expected to focus on two key areas:

- Providing professional services to customers to help them understand how their Internet, intranet and electronic commerce applications stack up to their competitors'. CA can then help them devise solutions, playing a role like EDS Corp. or IBM's consulting arm to assist in the development of application strategies.
- Hosting Web sites and managing content by keeping the information and design fresh. CA will also integrate Web applications with legacy and back-office systems, as well as handle Web site monitoring, storage management and other management tasks. CA will provide application templates — including sales and marketing as well as financial services — to help customers get started.

CA is also expected to make a strong push for a share of the nascent electronic commerce market by offering to build transaction-oriented sites.

The community hosting effort could be a real switch for the enterprise-oriented software company. CA is working on a system that would support thousands of sites constituting various communities, linked either by common interest or geographic location. For example, a user could query the system for restaurants in Kansas that serve sushi. The user would then be linked to a site for a Japanese restaurant.

CA will initially host these sites for free. As the sites become more sophisticated, such as incorporating electronic commerce, fees would kick in, sources explained.

CA is also working to support hybrid systems, such as those where the bulk of multimedia information is stored on a CD-ROM and the Web is used for updates.

Customers come first?

Although CA will work with customers that do not use its existing products, analysts expect the company to focus mostly on CA shops in which existing applications can be tailored for the Web. The division, analysts believe, is a way to push products, particularly the new Jasmine object-oriented database. For instance, CA has created a Jasmine-based online mall with video and sound.

"CA certainly has a vast array of database, development tools and system management tools that can be applied to Web sites," said Drew Brosseau, manager director for Cowen & Co., a financial services firm in Boston.

Analysts, pointing to CA's strategy of acquiring technologies and market share, questioned the prospects for such a homegrown effort. CA has tried to expand into areas such as desktop applications, "without a great deal of success," Brosseau said.

At CA World, the company is also expected to announce new Web management tools and unveil new UniCenter supporters, sources said. ■

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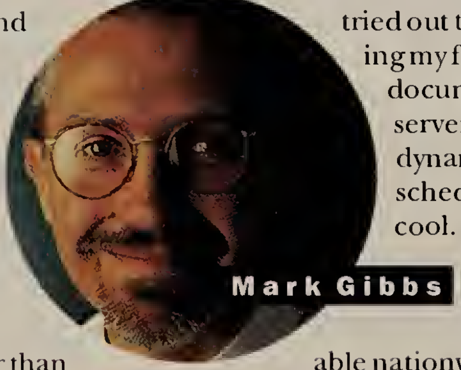
On being connected, bozos, the very hip and browserfication

A couple of things have been on my mind this week: Personal connectivity and the Web browser interface.

Being accessible and having access have become vital commercial issues. In the business world, handling a call or a fax immediately can spell the difference between getting an order and losing a client. And knowing what's going on in the world and your market on a second-by-second basis has become crucial for many poor souls.

That's the nature of the world today: We're reducing the delay between stimulus and response in commerce to the space between successive telephone rings.

Unfortunately, some of us have become a little too well-connected. There is nothing more aggravating than being in a cinema, deeply engrossed in the movie, and having the pager of the bozo in the seat behind you start to beep. Worse still if his cell phone starts to ring. And if he takes the call from his seat. . .well, death is just too good for him.


Mark Gibbs

Today, truly hip and really wired people (other than those with an espresso habit) can be ridiculously well-connected. Pagers are even built into watches (eat your heart out, Dick Tracy), two-way paging is now available, and just on the horizon are pagers that receive audio messages.

Curiously, audio paging is actually somewhat retro, as the original paging systems (so my friend Tony Miranda informs me) were actually voice pagers. They relied on an operator speaking to you via a radio link. But I digress.

Now I've used all sorts of devices for being connected and there are few that I really, absolutely need. Indeed, I've gone cold turkey on pagers and I don't give out my cell phone number.

But at one of my intranet seminars in Dallas a couple of weeks ago, I saw the latest hip way to be well-connected not only by voice, but also to the Web. I think I'm going to need this toy, er, state-of-the-art connectivity solution.

Two of the seminar attendees were from AT&T, and they had brought with them a beta test version of a new cell phone that can access a Web server to retrieve Hand-held Device Markup Language (HDML) documents (*NW*, July 15, page 10).

Truly hip and really wired people can be ridiculously well-connected.

HDML is a stripped-down version of the Web's lingua franca, HTML. It allows data to be displayed on the minuscule screen of a cellular phone and includes links that can be selected and followed. Graphics are not supported — well, at least not yet.

To use this system requires one of the newfangled cell phones that supports HDML and access to the Cellular Digital Packet Data (CDPD) network. I tried out the beta unit by checking my flight times, browsing documents from a Web server that were created dynamically from a flight schedule database. Way cool.

Alas, the system is still in beta and CDPD is not yet available nationwide. But you won't have long to wait. And when Java (tm) applets eventually can be downloaded into the phone. . .now you're talking. . .er, communicating.

Is this the wave of the future? Will we see the Web browser interface supported in lots of unlikely devices? Will our personal connectivity demands continue to increase exponentially?

Well, my guess is yes to all of the above. With Microsoft planning to use the browser interface model as the front end of its next release of Windows 95, I see no reason why the same interface technique won't be applied to lots of devices, and particularly communications systems. So watch out, the browserfication of the world is just beginning and it's probably coming to every communications device you own.

Now, please excuse me, I hear my shoe ringing.

Gibbs doesn't give out his shoe phone number, but you can reach him at mgibbs@gibbs.com or at (800) 622-1108, Ext. 504.

What will your business do when the Internet blacks out?

The Internet is falling! The Internet is falling!

Are you as tired of this warning as I am? I can't believe it has taken folks so long to recognize the Internet's obvious fallibility.

Of course the Internet will crash. It already has. It will do so again. You cannot guarantee flawless operation of such a huge, complex public system.

Rather than lamenting that, the big question is how are you going to keep doing business when the Internet goes down? As the Internet becomes a bigger part of your network strategy, are you prepared to deal with the inevitable problems ahead?

Dave Buerger

Users often endure minor temporary outages or quality dips by Internet service providers. The ISPs, of course, won't admit to such lapses, and if your business can put up with that kind of fuzzy performance, fine.

Some outages are more visible. Just ask the six million customers of America Online who were thrown offline during a 19-hour failure earlier this month.

You cannot guarantee flawless operation of such a huge, complex public system.

Apparently, AOL's network engineers corrupted network router tables. Judging from the day-long stream of "try logging on again in 15 minutes" messages, it took the engineers a while to realize their own mistake. Given their router expertise, I can't wait until they lay hands on switches.

AOL processes about six million E-mails daily, 15% of which are business-to-business messages. That means 900,000 business messages were delayed.

More than 400,000 users, mostly businesses, were also booted off Netcom On-Line Communications Services, Inc.'s national system in June.

The 12-hour blackout stemmed from the need to shut down and flush code from more than 100 routers. Apparently, someone inserted an extra "&" symbol in one router's border gateway protocol code.

That same week, Microsoft Corp. killed its commercial Microsoft Network for 10 hours for a backup power supply upgrade. The upgrade wasn't ready, so more than a million users will go offline again later this year so the job can be finished.

AT&T WorldNet is the second-largest ISP with more than 300,000 customers. It hopes to curtail unplanned outages with twice-weekly, 4-hour sequenced shutdowns for maintenance. (If E-mail is down, they leave Internet access up, and vice versa.)

Funny, I can't recall a maintenance program for regular telecommunications that cuts off service to customers.

The plain fact is that keeping the Internet tuned and trouble-free is a tough job.

It's no wonder. A new study by Network Wizards (www.nw.com) pegs nearly half a million Internet domains, with almost 13 million "advertised" connected computers in 156 countries and territories. That excludes millions of people on LANs, multiuser computers and computers hidden behind firewalls.

Annual growth rates are a killer. Hosts are growing at 72%. Web hosts are increasing at 1,165%. Domains in 37 countries have triple-digit growth. Only Brunei Darussalam and Uganda have single-digit growth.

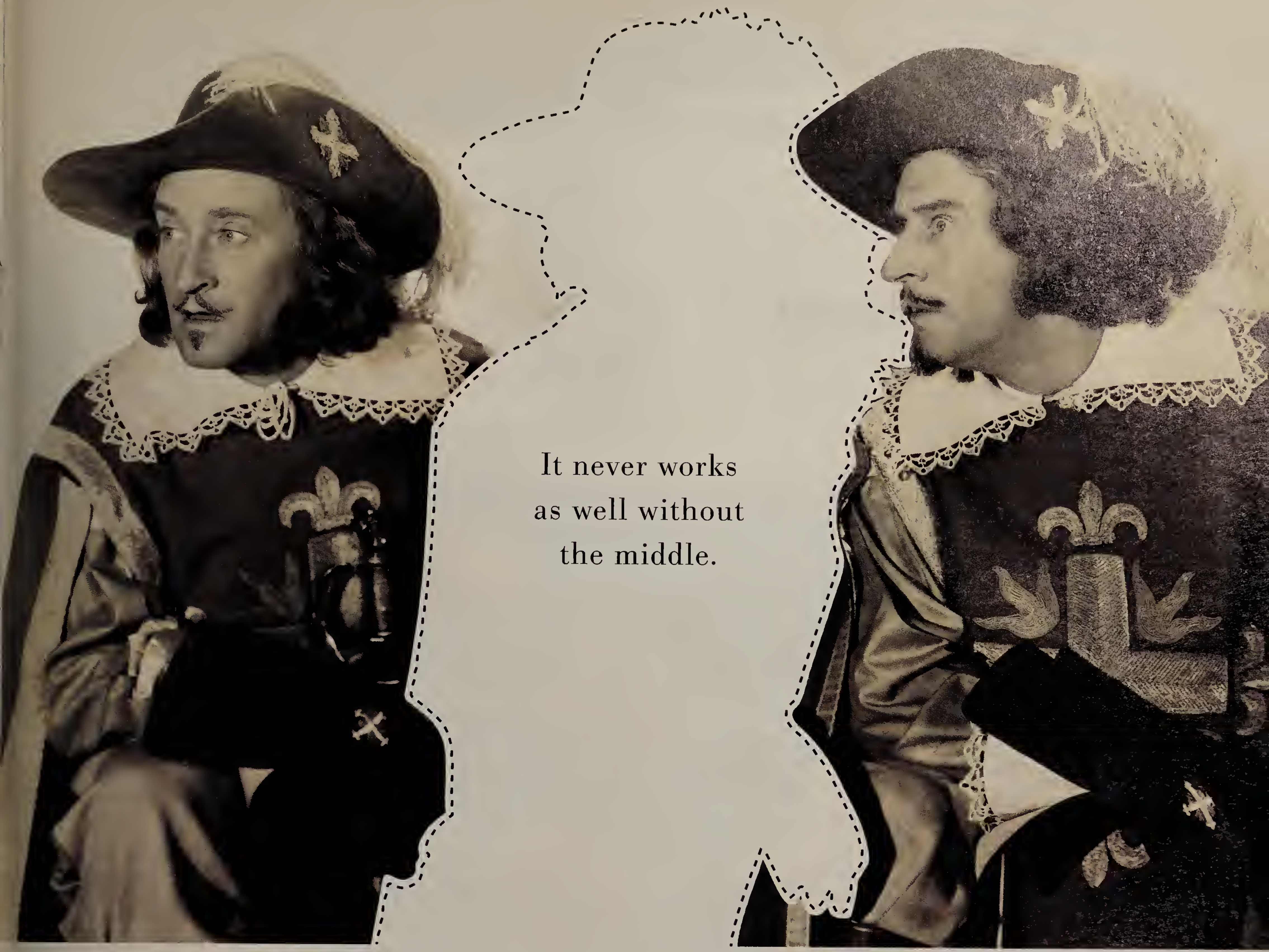
Huge, fast-growing systems are complex, and complexity guarantees occasional failure.

Last week, electrical power grids in the Western U.S. massively failed when some lines sagged onto trees. This shorted the system, cutting power to more than four million customers in nine states. It was the second major power blackout in six weeks.

Even the vaunted public telephone system is not immune to failure. It suffers brownouts each year. Big snafus cause headaches nationwide, such as the fire that destroyed the central office in Hinsdale, Ill., in 1988.

We need to quit squawking about the 'Net's future demise because trouble is here now and you better be prepared. E-mail me your contingency plans and I'll share the results — once the 'Net is up and running again.

Buerger is a networking industry consultant and writer in Atlanta. He can be reached at dave@buerger.com.



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I urge you to take a shot at joining this elite group by entering our 12th Annual User Excellence Awards competition. Once again, winners will be featured in our year-end Power Players issue and honored at ComNet in February.

You could be a part of it. Just get us your entry by Sept. 9 using any of the means described on the attached form. If you have any questions, don't hesitate to call us at (800) 622-1108, Ext. 408 or 419.

It's not every day you get the chance to blow your own horn, so I encourage you not to miss this one. It could be the launching point to a new stage in your networking career.

All the best,

Paul Desmond

Paul Desmond
Features Editor

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